Attachment 2

Antenna Specifications

Outdoor Omni-directional Antenna

OOA-360V06N0-3 VPol, 696-960/1710-2170MHz, 360°, 4.0/6.0dBi

Technical Specifications

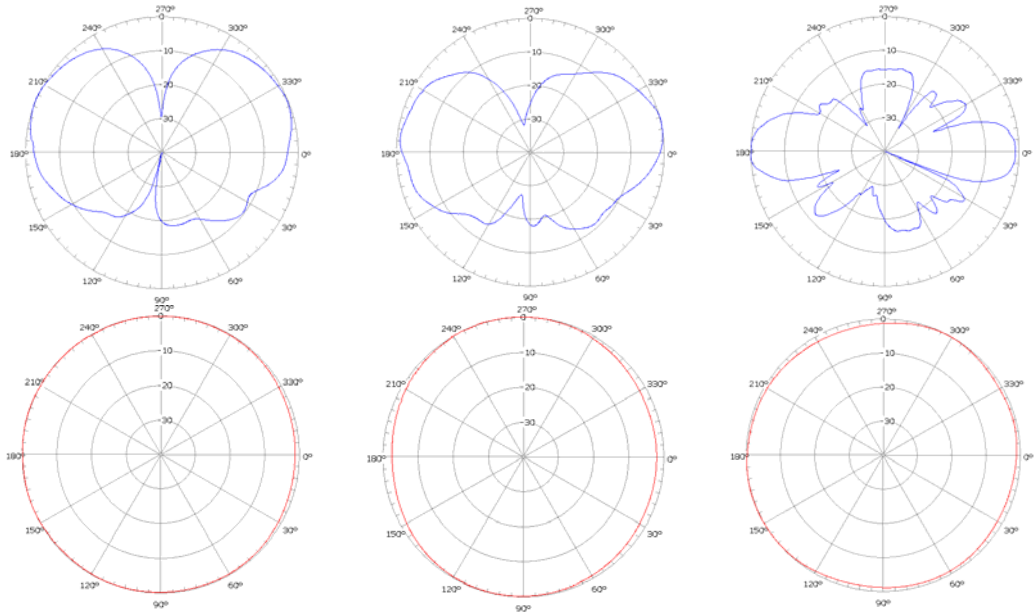
Electrical			
Frequency Range	MHz	696-960	1710-2170
Polarization		Vertical	
Gain	dBi	4.0±1	6.0±1
Horizontal Beamwidth	deg	360	
Vertical Beamwidth	deg	22-53	20-26
Electrical Downtilt – Fixed	deg	0	
VSWR		≤ 1.8	
Maximum Power	W	200	
Impedance	Ω	50	
Lightning Protection		Direct Ground	

Mechanical		
Dimensions, HxDia	mm (in)	650x60 (25.6x2.4)
Weight, with Mounting kit	kg (lb)	1 (2.2)
Radome Material and Color		Fiberglass, Light Grey
Radiating Element Material		Copper
Connector Type and Location		N-Female, Bottom
Operational Temperature	°C	-55 to +70
Operational Humidity	%	≤ 95
Operational Wind Speed	km/h (mph)	200 (124)
Shipping Dimensions, HxWxD	mm (in)	670x100x100 (26.4x3.9x3.9)
Shipping Weight	kg (lb)	1.2 (2.65)

Antenna Pattern

Vertical Pattern

Horizontal Pattern

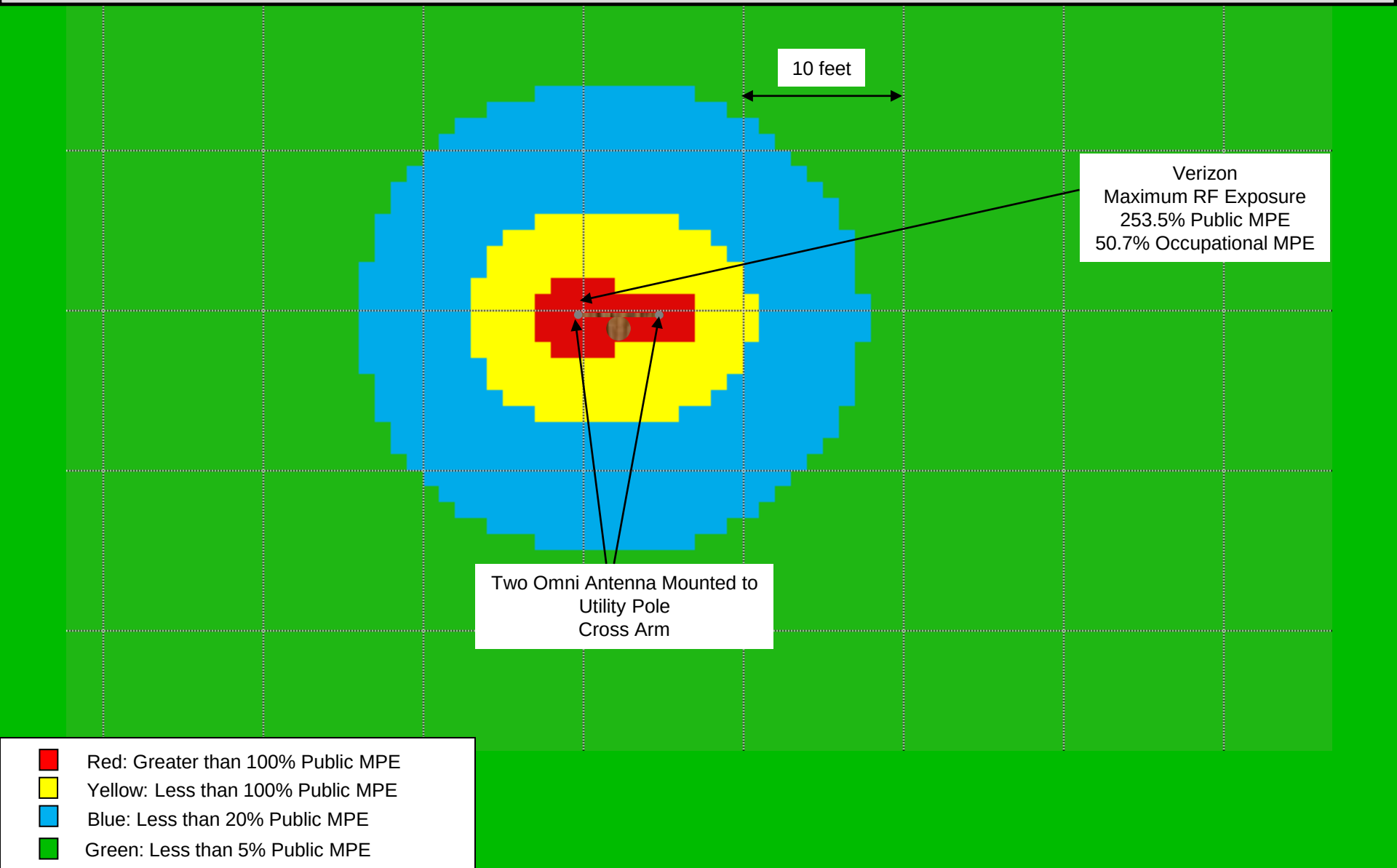


696MHz 896MHz 1900MHz

Appendix A-1

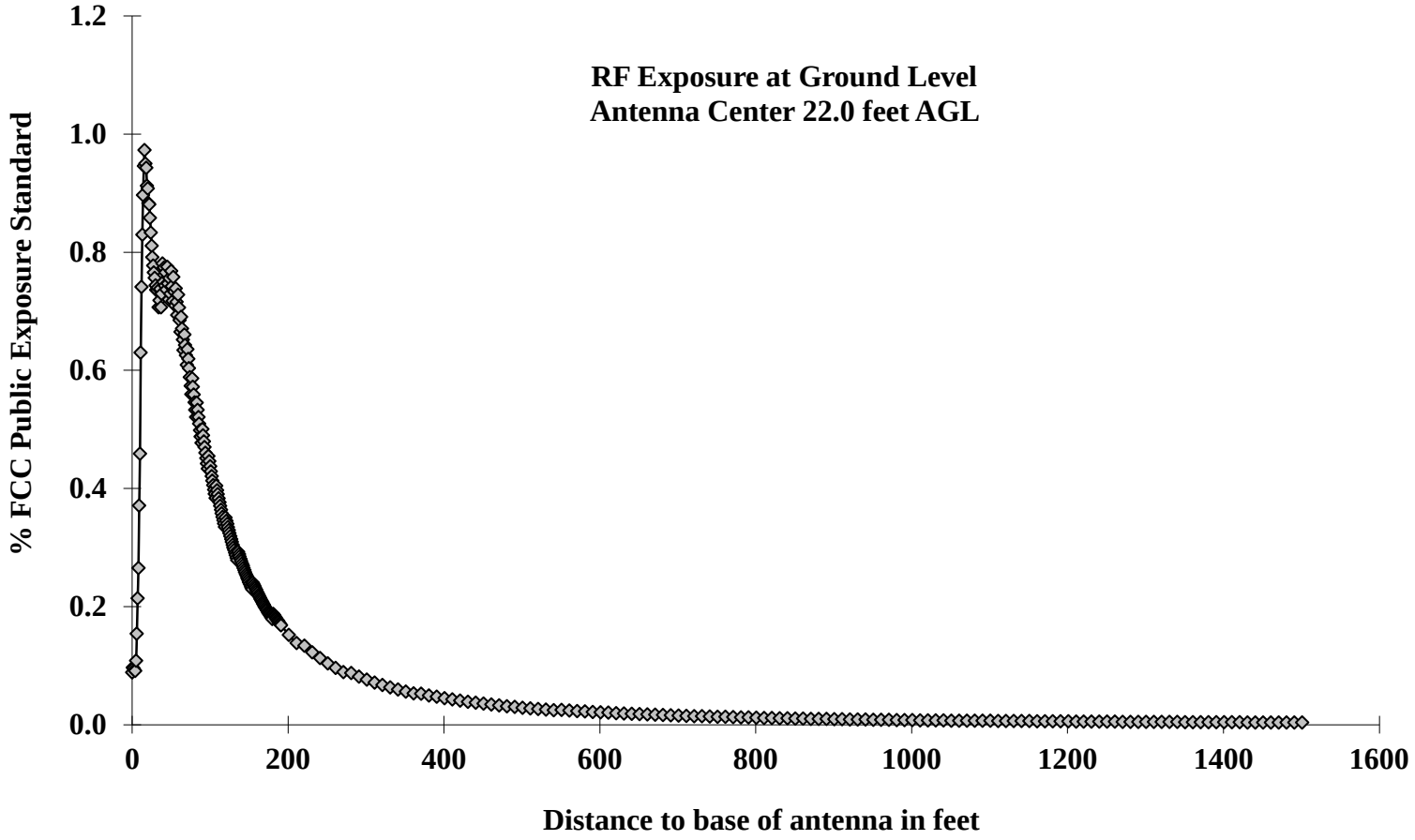
RF EXPOSURE AT ANTENNA LEVEL

RF EXPOSURE AT THE LEVEL OF THE ANTENNA
BASED ON PERCENTAGE OF FCC MAXIMUM
PUBLIC & OCCUPATIONAL EXPOSURE LIMIT



Appendix A-2

RF EXPOSURE AT GROUND LEVEL


RF Exposure at Ground Level
Antenna Center 22.0 feet AGL
% FCC Public Exposure Standard
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
200
400
600
800
1000
1200
1400
1600
Distance to base of antenna in feet

Appendix A-3

RF NOTICE SIGN

NOTICE

The radio frequency (RF) emissions at this site have been evaluated for potential RF exposure to personnel who may need to work near these antennae.

RF EXPOSURE AT 7 FEET OR CLOSER TO THE FACE OF THE ANTENNA MAY EXCEED THE FCC PUBLIC EXPOSURE STANDARD AND THUS ONLY QUALIFIED RF WORKERS MAY WORK IN THIS 7 FOOT EXCLUSION ZONE. OTHERS WHO NEED TO WORK IN THE EXCLUSION ZONE SHOULD CALL _____

FOR INSTRUCTIONS. REFER TO SITE # _____

Reference: Federal Communications Commission (FCC) Public Exposure Standard. OET Bulletin-65, Edition 97-01, August 1997.

STATEMENT OF EXPERIENCE

Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM, FAAPM
(800) 760-8414 jbushberg@hampc.com

Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. In addition, Dr. Bushberg has extensive experience and lectures on several related topics including medical physics, radiation protection, (ionizing and non-ionizing), radiation biology, the science of risk assessment and effective risk communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University was on various aspects of the biological effects of microwave radiation. He has maintained a strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, the California Council on Science and Technology, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections. Dr. Bushberg has performed RF & ELF environmental field measurements and recommend appropriate mitigation measures for numerous transmission facilities in order to assure compliance with FCC and other safety regulations and standards. The consultation services provided by Dr. Bushberg are based on his professional judgement as an independent scientist, however they are not intended to necessarily represent the views of any other organization.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of nonionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of nonionizing electromagnetic radiation. Dr.Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurements (NCRP). He is also the Senior Scientific Vice-President of the NCRP and chairman of the NCRP Board of Directors. Dr. Bushberg has served as chair of the NCRP committee on Radiation Protection in Medicine and he continues to serve as a member of this committee as well as the NCRP scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based, in large part, on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of responsibility the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg also served for several years as a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the FCC and the FDA Center for Devices and Radiological Health.

Dr. Bushberg is a full member of the Bioelectromagnetics Society, the Health Physics Society and the Radiation Research Society. Dr. Bushberg received both a Masters of Science and Ph.D. from the Department of Bionucleonics at Purdue University. Dr. Bushberg is a fellow of the American Association of Physicists in Medicine and is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to California, Dr. Bushberg was on the faculty of Yale University School of Medicine.

JERROLD T. BUSHBERG Ph.D., DABMP, DABSNM, FAAPM
♦HEALTH AND MEDICAL PHYSICS CONSULTING♦

7784 Oak Bay Circle Sacramento, CA 95831
(800) 760-8414–jbushberg@hampc.com

Bhavani Yella
Crown Castle
890 Tasman Drive
Milpitas, CA 95035

April 23, 2013

Introduction

At your request, I have reviewed the technical specifications and calculated the maximum potential radiofrequency, (RF), power density from the proposed Crown Castle (CC) Dual Panel Distributed Antenna System (DAS) sites proposed for the right-of-way in Santa Barbara, CA. A DAS is a network of spatially separated antenna sites called "nodes" connected to a common source that provides wireless service within a geographic area. DAS antennae are typically installed near the top of light standards or on utility poles. The idea is to split the transmitted signal among several antenna sites, separated in space so as to provide coverage over the same area as a single antenna but with reduced total power and improved reliability. Thus a single antenna radiating at high power is replaced by a group (i.e., network) of low-power antennas to cover the same area. Some of the other advantages of DAS include the ability to provide service for multiple wireless carriers without the need to have separate antenna sites for each carrier at each location and the ability to place the antennae on existing vertical structures such as light or utility poles.

This proposed DAS node will utilize two panel antennae mounted on the cross arm of a utility pole. The antenna specified is Kathrien model 840-10525. The maximum effective radiated power (ERP) from the antennae will be up to 87.1 watts at approximately 775 MHz utilizing LTE transmission technology; 50 watts at approximately 850 MHz and 87.1 watts at approximately 1,900 MHz utilizing CDMA/EVDO transmission technology. The distance from the antenna center to the ground will be at least 27.75 feet. This proposed DAS node will be located at 2000 E. Valley Dr, Santa Barbara, CA, 93108 and the site plan is shown in attachment one. The antenna specification details are depicted in attachment two.

Calculation Methodology

Calculations at the level of the antenna were made in accordance with the cylindrical model recommendations for near-field analysis contained in the Federal Communications Commission, Office of Engineering and Technology Bulletin 65 (OET 65) entitled "Evaluating Compliance with FCC-Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." RF exposure calculations at ground level were made using equation 10 from the same OET document. Several assumptions were made in order to provide the most conservative or "worst case" projections of power densities. Calculations were made assuming all channels were operating simultaneously at their maximum design effective radiated power. Attenuation (weakening) of the signal that would result from surrounding foliage or buildings was ignored. Buildings or other structures can reduce the signal strength by a factor of 10 (i.e., 10 dB) or more depending upon the construction material. In addition, for ground level calculations, the ground or other surfaces were considered to be perfect reflectors

(which they are not) and the RF energy was assumed to overlap and interact constructively at all locations (which they would not) thereby resulting in the calculation of the maximum potential exposure. In fact, the accumulations of all these very conservative assumptions, will significantly overestimate the actual exposures that would typically be expected from such a facility. However, this method is a prudent approach that errs on the side of safety.

RF Safety Standards

The two most widely recognized standards for protection against RF field exposure are those published by the American National Standards Institute (ANSI) C95.1 and the National Council on Radiation Protection and measurement (NCRP) report #86. The NCRP is a private, congressionally chartered institution with the charge to provide expert analysis of a variety of issues (especially health and safety recommendations) on radiations of all forms. The scientific analyses of the NCRP are held in high esteem in the scientific and regulatory community both nationally and internationally. In fact, the vast majority of the radiological health regulations currently in existence can trace their origin, in some way, to the recommendations of the NCRP.

All RF exposure standards are frequency-specific, in recognition of the differential absorption of RF energy as a function of frequency. The most restrictive exposure levels in the standards are associated with those frequencies that are most readily absorbed in humans. Maximum absorption occurs at approximately 80 MHz in adults. The NCRP maximum allowable continuous occupational exposure at this frequency is 1,000 $\mu W/cm^2$. This compares to 2,933 $\mu W/cm^2$ at cellular frequencies and 5,000 $\mu W/cm^2$ at PCS frequencies that are absorbed much less efficiently than exposures in the VHF TV band.

The traditional NCRP philosophy of providing a higher standard of protection for members of the general population compared to occupationally exposed individuals, prompted a two-tiered safety standard by which levels of allowable exposure were substantially reduced for "uncontrolled " (e.g., public) and continuous exposures. This measure was taken to account for the fact that workers in an industrial environment are typically exposed no more than eight hours a day while members of the general population in proximity to a source of RF radiation may be exposed continuously. This additional protection factor also provides a greater margin of safety for children, the infirmed, aged, or others who might be more sensitive to RF exposure. After several years of evaluating the national and international scientific and biomedical literature, the members of the NCRP scientific committee selected 931 publications in the peer-reviewed scientific literature on which to base their recommendations. The current NCRP recommendations limit continuous public exposure at cellular frequencies (e.g., ~820MHz) to 550 $\mu W/cm^2$ and to 1,000 $\mu W/cm^2$ at PCS frequencies (~1,900 MHz).

The 1992 ANSI standard was developed by Scientific Coordinating Committee 28 (SCC 28) under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). This standard, entitled "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991), was issued in April 1992 and subsequently adopted by ANSI. A revision of this standard (C95.1-2005) was completed in October 2005 by SCC 39 the IEEE International Committee on Electromagnetic Safety. Their recommendations are similar to the NCRP recommendations for the maximum permissible exposure (MPE) to the public PCS frequencies (950 $\mu W/cm^2$ for continuous exposure at 1,900 MHz) and incorporates the convention of providing for a greater margin of safety for public as compared with occupational exposure. Higher whole body exposures are allowed for brief periods provided that no 30 minute time-weighted average exposure exceeds these aforementioned limits.

On August 9, 1996, the Federal Communications Commission (FCC) established a RF exposure standard that is a hybrid of the current ANSI and NCRP standards. The maximum permissible exposure values used to

assess environmental exposures are those of the NCRP (i.e., maximum public continuous exposure at cellular and PCS frequencies of 550 $\mu W/cm^2$ and 1,000 $\mu W/cm^2$ respectively). The FCC issued these standards in order to address its responsibilities under the National Environmental Policy Act (NEPA) to consider whether its actions will "significantly affect the quality of the human environment." In as far as there was no other standard issued by a federal agency such as the Environmental Protection Agency (EPA), the FCC utilized their rulemaking procedure to consider which standards should be adopted. The FCC received thousands of pages of comments over a three-year review period from a variety of sources including the public, academia, federal health and safety agencies (e.g., EPA & FDA) and the telecommunications industry. The FCC gave special consideration to the recommendations by the federal health agencies because of their special responsibility for protecting the public health and safety. In fact, the MPE values in the FCC standard are those recommended by EPA and FDA. The FCC standard incorporates various elements of the 1992 ANSI and NCRP standards which were chosen because they are widely accepted and technically supportable. There are a variety of other exposure guidelines and standards set by other national and international organizations and governments, most of which are similar to the current ANSI/IEEE or NCRP standard, figure one.

The FCC standards "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation" (Report and Order FCC 96-326) adopted the ANSI/IEEE definitions for controlled and uncontrolled environments. In order to use the higher exposure levels associated with a controlled environment, RF exposures must be occupationally related (e.g., wireless company RF technicians) and they must be aware of and have sufficient knowledge to control their exposure. All other environmental areas are considered uncontrolled (e.g., public) for which the stricter (i.e., lower) environmental exposure limits apply. All carriers were required to be in compliance with the new FCC RF exposure standards for new telecommunications facilities by October 15, 1997. These standards applied retroactively for existing telecommunications facilities on September 1, 2000.

The task for the physical, biological, and medical scientists that evaluate health implications of the RF data base has been to identify those RF field conditions that can produce harmful biological effects. No panel of experts can guarantee safe levels of exposure because safety is a null concept, and negatives are not susceptible to proof. What a dispassionate scientific assessment can offer is the presumption of safety when RF-field conditions do not give rise to a demonstrable harmful effect.

Summary & Conclusions

This CC utility pole DAS node shown in attachment one, operating with the characteristics as specified above and observing an four foot (public) and two foot (occupational) exclusion zone directly in front of and at the same elevation as the antenna, will be in full compliance with FCC RF public and occupational safety exposure standards. These transmitters, by design and operation, are low-power devices. Even under maximal exposure conditions in which the antenna is transmitting at its greatest design basis ERP, the maximum exposure at the elevation of the antenna will not result in RF exposures in excess of the FCC public RF safety standard at four or more feet from the surface of the antenna, (see appendix A-1). The maximum RF exposure at ground level will not be in excess of 2.4% of, (i.e., 41 times lower than), the FCC public safety standard, (see appendix A-2).

A chart of the electromagnetic spectrum and a comparison of RF power densities from various common sources is presented in figures two and three respectively in order to place exposures from DAS wireless systems in perspective. RF exposure in the neighborhood served by this and other DAS sites are very low due to three main factors. First, as previously stated, DAS is a relatively low-power technology. The maximum

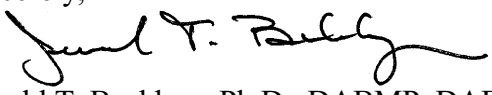
power into the antennae will be less than 448.4 watts. In addition, DAS sites utilize directional antennae that focus the RF energy toward the horizon, (i.e., parallel with the ground at the level of the antenna), thus only a very small percentage of the RF energy is emitted directly down toward the ground. This is similar to a lighthouse beacon that sends the majority of its light out toward the horizon with very little reaching the base of the lighthouse or people living nearby. Finally, as shown on the graph in appendix A-2, as one gets farther away from the site, the change in RF exposure intensity becomes more uniform with distance. Eventually there is a very rapid and consistent decrease in exposure with distance. Like all forms of electromagnetic energy, including light, the decrease in exposure at this point is proportional to the square of the increased distance. Thus, if the exposure at this point was 1% of the public exposure standard and one simply moved 10 times further away, (all other conditions being the same), the exposure would be 10^2 or 100 times less than before (i.e., 0.01% of the public exposure standard).

It is also important to realize that the FCC maximum allowable exposures are not set at a threshold between safety and known hazard but rather at 50 times below a level that the majority of the scientific community believes may pose a health risk to human populations. Thus, the previously mentioned maximum ground level exposure from these sites represents a "safety margin" from this threshold of potentially adverse health effects of more than 2,080 times.

Given the low levels of radiofrequency fields that would be generated from this CC directional antenna installations and given the evidence on RF biological effects in a large data base, there is no scientific basis to conclude that harmful effects will attend the utilization of this proposed wireless telecommunications facility. This conclusion is supported by a large number of scientists that have participated in standard-setting activities in the United States who are overwhelmingly agreed that RF radiation exposure below the FCC exposure limits has no demonstrably harmful effects on humans. An RF caution sign, containing appropriate contact information and indicating the stay back distance beyond which the RF exposures do not exceed the public and occupational maximum permissible exposure (MPE), should be placed near the antenna (see appendix A-3).

These findings are based on my professional evaluation of the scientific issues related to the health and safety of non-ionizing electromagnetic radiation and my analysis of the technical specification as provided by CC. The opinions expressed herein are based on my professional judgement and are not intended to necessarily represent the views of any other organization or institution. Please contact me if you require any additional information.

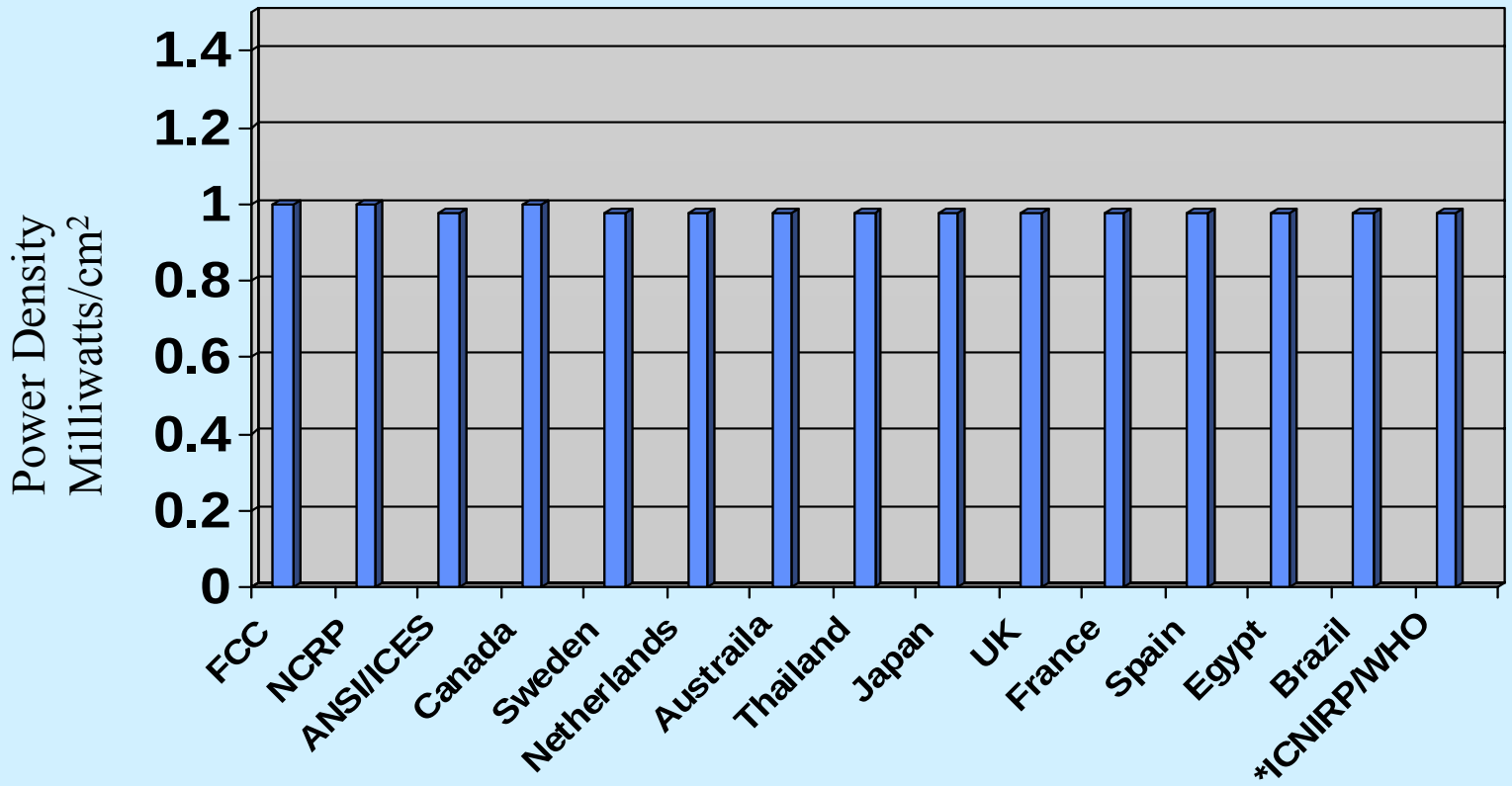
Sincerely,



Jerrold T. Bushberg Ph.D., DABMP, DABSNM
Diplomate, American Board of Medical Physics (DABMP)
Diplomate, American Board of Science in Nuclear Medicine (DABSNM)
Fellow, American Association of Physicists in Medicine (FAAPM)

Enclosures: Figures 1-3; Attachment 1,2; Appendices A1-A3 and Statement of Experience.

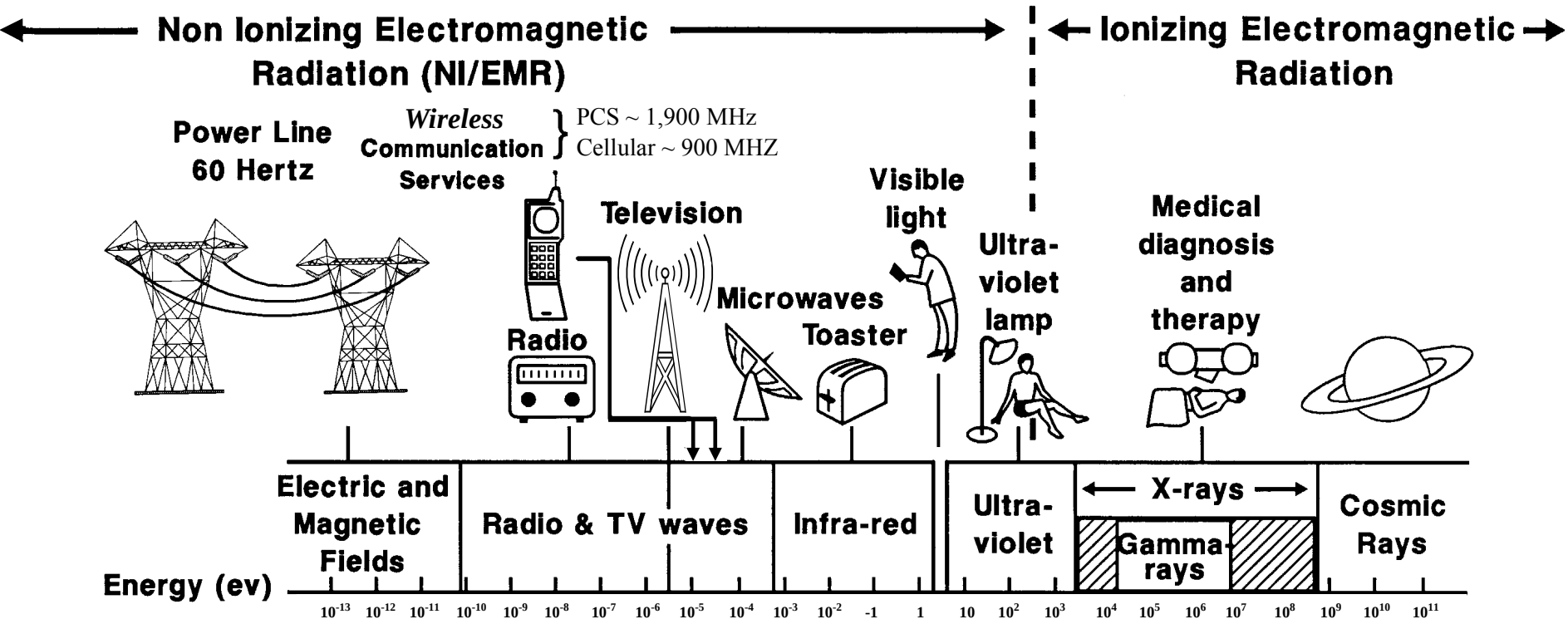
National and International Public RF Exposure Standards (DAS @ 1,950 MHz)



***International Commission on Non-Ionizing Radiation Protection (ICNIRP) Public Safety Exposure Standard. ICNIRP standard recommended by the World Health Organization (WHO). Members of the ICNIRP Scientific Committee were from:**

- **Australia**
- **Finland**
- **France**
- **Germany**
- **Hungary**
- **Italy**
- **Sweden**
- **Japan**
- **United Kingdom**
- **United States**

Figure 1



The Electromagnetic Spectrum

Figure 2

Typical Exposure from Various Radio Frequency / Microwave Sources

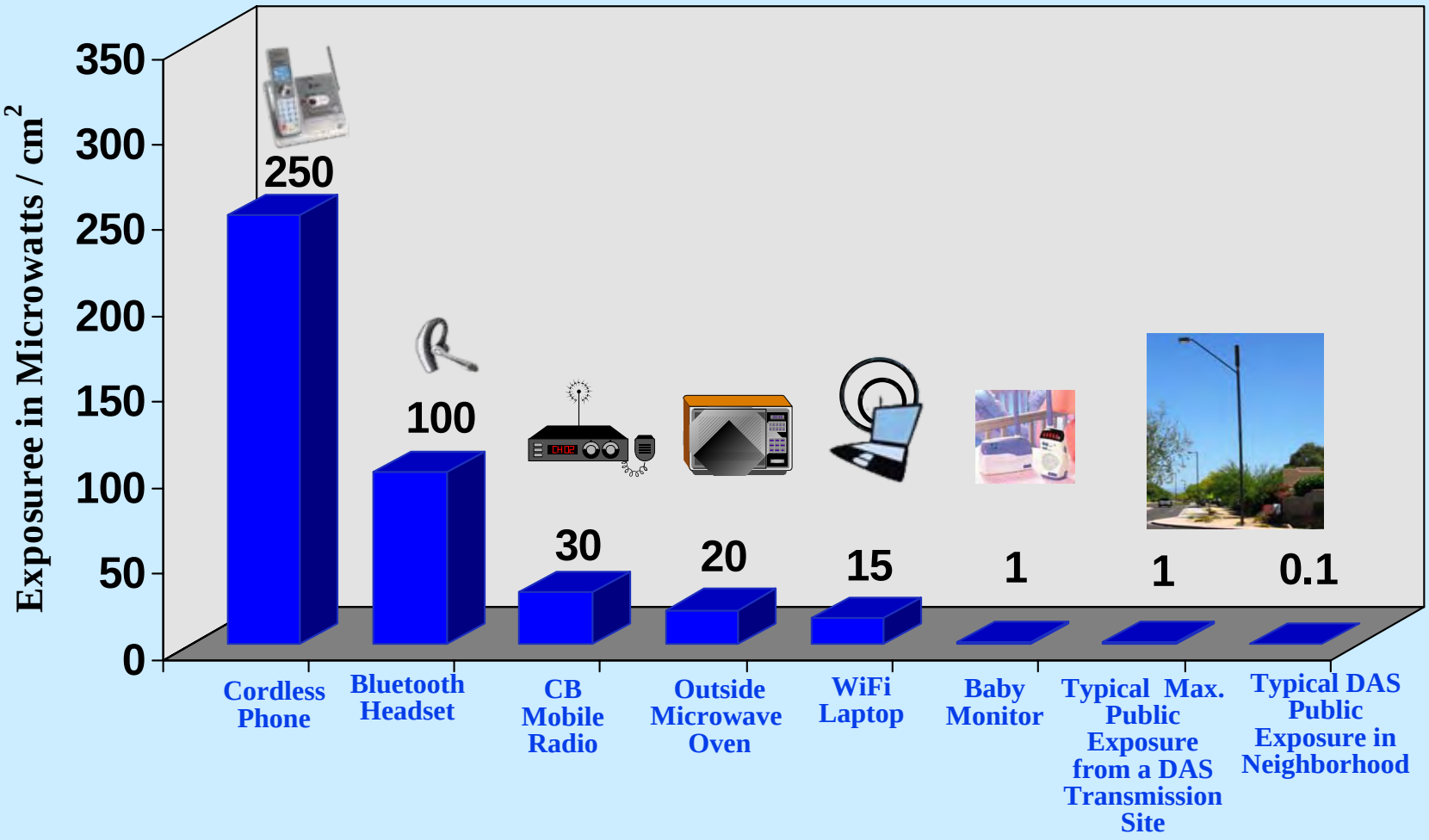


Figure 3

Attachment 1

Proposed Utility Pole Mounted Dual Panel Antenna DAS Node

CROWN CASTLE NG WEST, INC

VERIZON MONTECITO-MON04

R.O.W. ADJACENT TO 617 OLIVE RD
SANTA BARBARA, CA 93108

GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A PERMIT HAS BEEN ISSUED.
2. UPON ISSUANCE OF A PERMIT, NO WORK WILL BE PERMITTED ON WEEKENDS OR HOLIDAYS WITHOUT PERMISSION FROM THE ENGINEERING DEPARTMENT.
3. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY THE LOCAL JURISDICTION DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR CITY LAWS, ORDINANCES, REGULATIONS, OR POLICIES, INCLUDING, BUT NOT LIMITED TO, THE FEDERAL ENDANGERED SPECIES ACT OF 1973 AND AMENDMENTS THERETO (16 USC SECTION 1531 ET.SEQ.).
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, SUCH MONUMENTS SHALL BE REPLACED WITH APPROPRIATE MONUMENTS BY A LAND SURVEYOR, A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FIELD AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE LOCAL JURISDICTION FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
5. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER BE ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TWO DAYS BEFORE YOU DIG.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
7. CONTRACTOR SHALL SUBMIT TO THE LOCAL JURISDICTION, A CONSTRUCTION PLAN TO PROTECT WATER MAINS PRIOR TO COMMENCING CONSTRUCTION.
8. CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUIT, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
9. CONTRACTOR SHALL NOTIFY THE LOCAL JURISDICTION. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING WORK WITHIN 10' OF ALL SEWER, WATER, AND STORMDRAIN MAIN INCLUDING ALL CROSSINGS.
10. THIS PROJECT WILL BE INSPECTED BY ENGINEERING AND CAPITAL PROJECTS DEPARTMENT, FIELD ENGINEERING DIVISION.
11. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY RESIDENT ENGINEER PRIOR TO THE ACCEPTANCE OF THIS PROJECT.
12. PUBLIC IMPROVEMENT SUBJECT TO DESUETUDE OR DAMAGE." IF REPAIR OR REPLACEMENT OF SUCH PUBLIC IMPROVEMENTS IS REQUIRED, THE OWNER SHALL OBTAIN THE REQUIRED PERMITS FOR WORK IN THE PUBLIC RIGHT-OFWAY, SATISFACTORY TO THE PERMIT – ISSUING AUTHORITY.
13. PRIOR TO ANY DISTURBANCE TO THE SITE, EXCLUDING UTILITY MARKS-OUTS AND SURVEYING, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRE-CONSTRUCTION MEETING WITH THE LOCAL JURISDICTION FIELD ENGINEERING DIVISION.
14. PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION SHOWN ON THESE PLANS. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE. THE CONTRACTOR IS RESPONSIBLE TO ATTEND THE LOCAL JURISDICTIONS MONTHLY UTILITY COORDINATION COMMITTEE THE CONSTRUCTION ACTIVITIES WITH THE CITY AND ALL OTHER CONTRACTORS SO THAT NO TRENCH IS CUT WITHIN ANY OF THE CITY STREETS THAT HAVE BEEN CONSTRUCTED, REPAIRED, OR SLURRY SEALED WITHIN THREE YEARS OF THE STREET CONSTRCTUION/RESURFACING DATE.
15. MANHOLES OR COVERS SHALL BE LABELED "CROWN CASTLE" OR "CROWN CASTLE NG WEST".
16. CONTRACTOR SHALL IMPLEMENT AN EROSION AND SEDIMENT CONTROL PROGRAM DURING THE PROJECT CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL MEET THE APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCE CONTROL BOARD.
17. THE CONTRACTOR SHALL HAVE EMERGENCY MATERIALS AND EQUIPMENT ON HAND FOR UNFORESEEN SITUATIONS, SUCH AS DAMAGE TO UNDERGROUND WATER, SEWER, AND STORM DRAIN FACILITIES WHEREBY FLOWS MAY GENERATE EROSION AND SEDIMENT POLLUTION.

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE CITY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF THESE NOTES AND THE CITY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1. THE CONTRACTOR SHALL VERIFY THE LOCATION EXISTING UNDERGROUND UTILITIES INCLUDING SEWER LATERALS AND WATER SERVICES TO INDIVIDUAL LOTS BOTH VERTICAL AND HORIZONTAL PRIOR TO COMMENCING IMPROVEMENT OPERATIONS.
2. CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS OF PLANS IF REVISION IS NECESSARY BECAUSE OF LOCATION OF EXISTING UTILITIES.
3. LOCATION AND ELEVATIONS OF IMPROVEMENTS, TO BE MET BY WORK, SHALL BE CONFIRMED BY FIELD MEASUREMENT PRIOR TO CONSTRUCTION OF NEW WORK.
4. GRADES SHOWN ARE FINISH GRADES, CONTRACTOR SHALL DETERMINE NECESSARY SUB GRADE ELEVATIONS AND SHALL CONSTRUCT SMOOTH TRANSITION BETWEEN FINISH GRADES SHOWN.
5. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITION DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS PROVISION SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXPECTING FOR LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
6. THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR COMPLIANCE WITH THE PROVISIONS OF THE STATE OF CALIFORNIA SAFETY ORDERS.
7. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FROM EXISTING RECORDS AND CORROBORATED, WHERE POSSIBLE WITH FIELD TIES. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE LOCATIONS SHOWN, BOTH HORIZONTALLY AND VERTICALLY, PRIOR TO CONSTRUCTION. IF EXISTING LOCATIONS VARY SUBSTANTIALLY FROM THE PLANS, THE ENGINEER SHOULD BE NOTIFIED TO MAKE ANY CONSTRUCTION CHANGES REQUIRED.
8. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT FOR ALL SEWER AND WATER MAIN UNDER CROSSING IN ACCORDANCE WITH PART 1 SECTION 5-2 OF THE STANDARD SPECIFICATION.
9. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUITS, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL SUBMIT WORK PLANS FOR ALL BORE OPERATIONS TWO WEEKS PRIOR TO COMMENCING WORK.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
12. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT.

Caltrans

DIGALERT
1-800-227-2600
CALL AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA
TICKET # _____

VICINITY MAP – N.T.S.

GROUND BUS BAR
MECH. GRND. CONN.
CADWELD
ELECTRIC BOX
TELEPHONE BOX
EXISTING SERVICE POLE
SIDEWALK FLAG
EX. MANHOLE
LIGHT POLE
FOUNDATION
SPOT ELEV.
SET POINT
REVISION
DETAIL REF.
ELEVATION REF.
SECTION REF.
PROP./LEASE LINE
MATCH LINE
WORK POINT
TELE. CONDUIT
CENTERLINE
ELECT. CONDUIT
COAXIAL CABLE
MYERS PEDESTAL
VAULT STANDARD 2'X3'
STEEL POLE

SYMBOLS, LINETYPES AND HATCH PATTERNS

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS

APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

*2010 CALIFORNIA BUILDING CODE
*2010 CALIFORNIA MECHANICAL CODE
*2010 CALIFORNIA PLUMBING CODE
*2010 CALIFORNIA ELECTRICAL CODE

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

PROJECT DESCRIPTION

PROJECT CONSISTS OF INSTALLATION OF:

1. PANEL ANTENNA ON EXISTING UTILITY POLE
2. EQUIPMENT VAULT AT BASE OF EXISTING POLE
3. EQUIPMENT PEDESTAL W/ BBU AND ELECTRICAL METER AT BASE OF POLE

SHEET INDEX:

EROSION AND SEDIMENT CONTROL NOTES

TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE LOCAL JURISDICTION "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED GRADING/IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER AND/OR WATER POLLUTION CONTROL PLAN (WPCP).
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. FOR INLETS LOCATED AT SUMPS ADJACENT TO TOP OF SLOPES, THE CONTRACTOR SHALL ENSURE THAT WATER DRAINING TO THE SUMP IS DIRECTED INTO THE INLET AND THAT A MINIMUM OF 1.00' FREEBOARD EXISTS AND IS MAINTAINED ABOVE THE TOP OF THE INLET. IF FREEBOARD IS NOT PROVIDED BY GRADING SHOWN ON THESE PLANS, THE CONTRACTOR SHALL PROVIDE IT VIA TEMPORARY MEASURES, I.E. GRAVEL BAGS OR DIKES.
4. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR OR QUALIFIED PERSON SHALL CHECK AND MAINTAIN ALL LINED AND UNLINED DITCHES AFTER EACH RAINFALL.
6. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
7. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON, ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
8. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL MEASURES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
9. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
11. ALL EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED GRADING PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
12. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
13. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
14. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDIMENT CONTROL MEASURES.
15. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

TRAFFIC CONTROL NOTES

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN (11" X 17") FOR APPROVAL PRIOR TO STARTING WORK. THE PLAN SHOULD BE SUBMITTED TO THE TRAFFIC CONTROL PERMIT COUNTER. CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO STARTING WORK, AND A MINIMUM FIVE (5) DAYS IF WORK WILL AFFECT A BUS STOP OR AN EXISTING TRAFFIC SIGNAL, OR IF WORK WILL REQUIRE A ROAD OR ALLEY CLOSURE.

FOOTAGE TOTALS	
ASPHALT CUT	–
DIRT TRENCH	–
PUNCH THRU	–
BORE	–
TOTAL	–
R&R SWF TOTAL	–

PROJECT DICTIONARY

SITE ADDRESS:
ROW ADJACENT TO 617 OLIVE RD
SANTA BARBARA, CA 93108

APPLICANT:
CROWN CASTLE NG WEST, INC
2125 WRIGHT AVE, SUITE #C9
LA VERNE, CA 91750
CONTACT: DANIEL NUESKE
PHONE: (714) 472-1577

CIVIL ENGINEER:
CONNELL DESIGN GROUP, LLC
26455 RANCHO PARKWAY SOUTH
LAKE FOREST, CA 92630
CONTACT: FRANK CARTER
(949) 310-8233 PHONE
(949) 753-8833 FAX

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 01/31/2013	ISSUED FOR REVIEW
1	SA 03/19/2013	ISSUED FOR APPROVAL

ENGINEER/CONSULTANT:

Civil Engineer

CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON04
VERIZON MONTECITO-MON04

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C-1

ROW ADJACENT TO 617 OLIVE RD
SANTA BARBARA, CA 93108

LAT: 34.43827°
LONG: -119.61056°

SHEET TITLE:

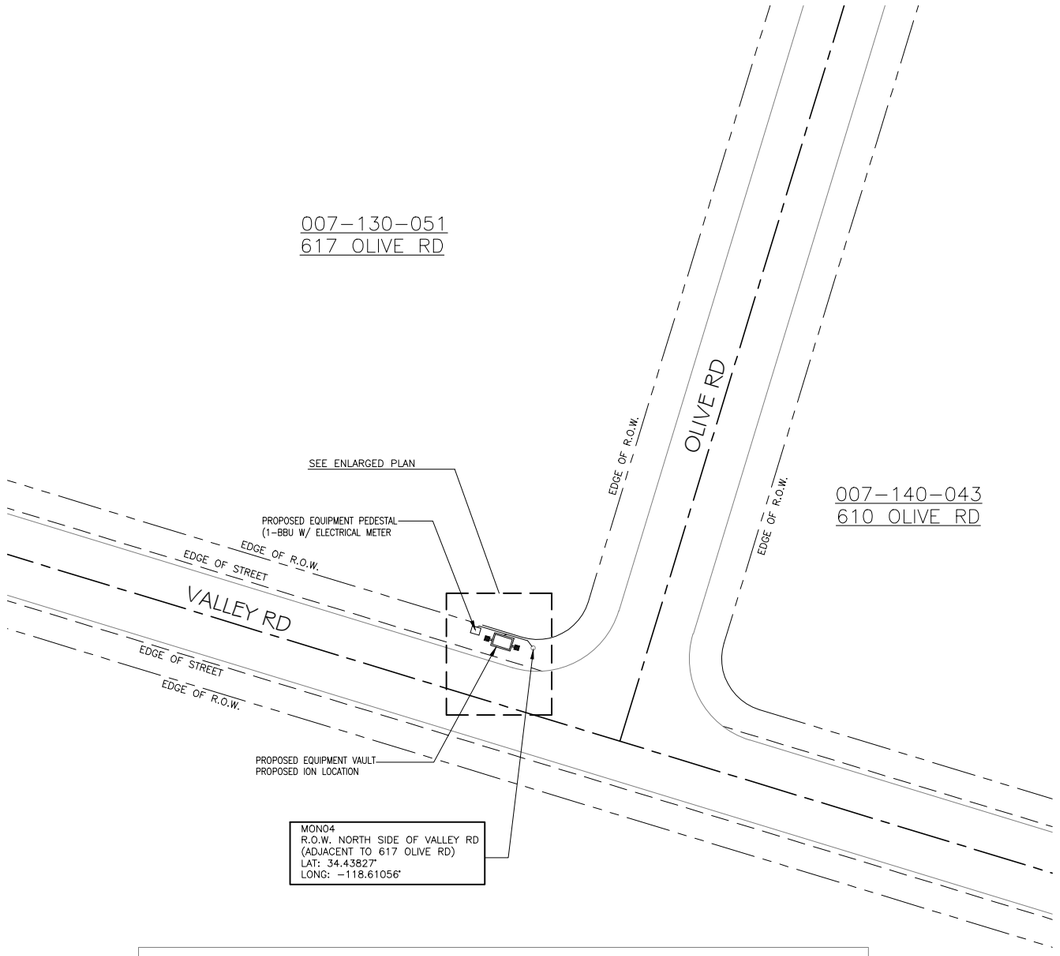
TITLE SHEET

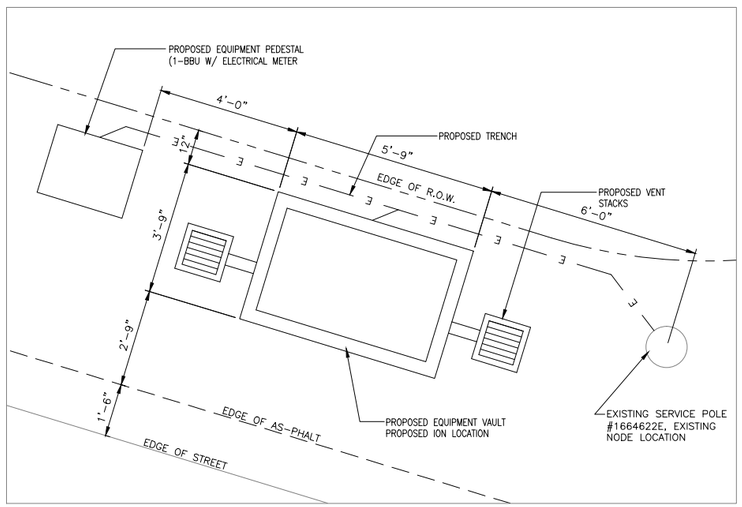
DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

T-1

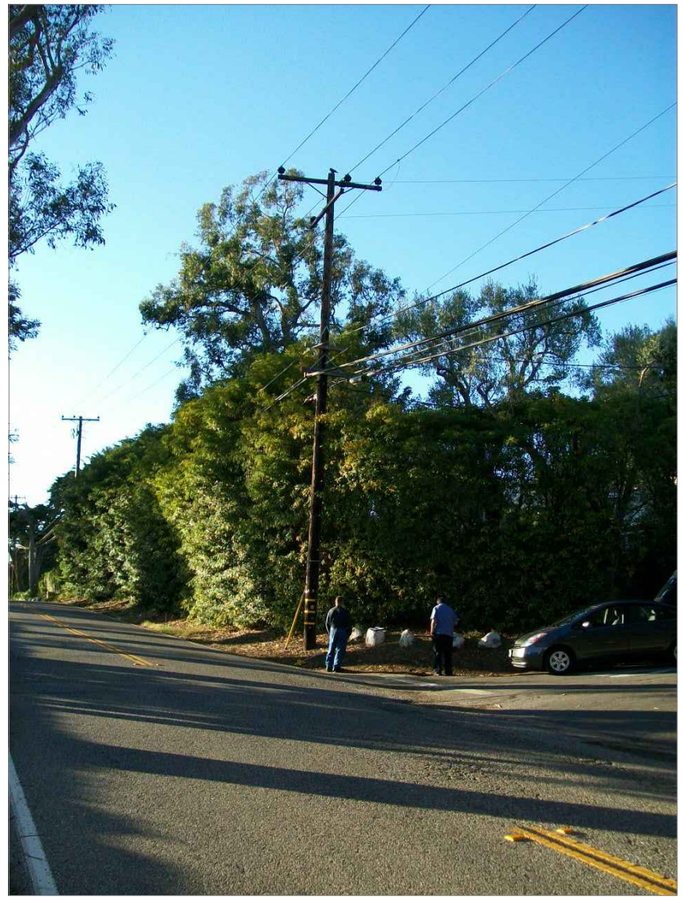




ENLARGED PLAN

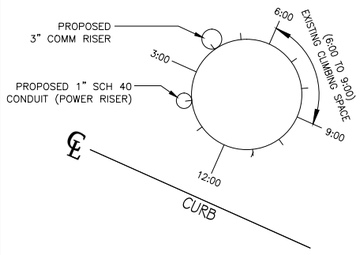
N

SITE PLAN SCALE: 1"=20'-0" (0 10' 20') 1

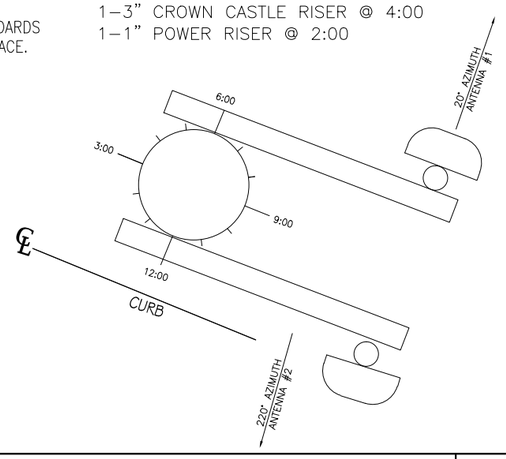


EXISTING PHOTO SCALE: N.T.S. 3

POLE WILL BE STEPPED IN ACCORDANCE TO G095 STANDARDS IN RESPECT TO CLIMBING SPACE.



1-3" CROWN CASTLE RISER @ 4:00
1-1" POWER RISER @ 2:00



RISER PROFILE SCALE: N.T.S. 2

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NG WEST, INC.

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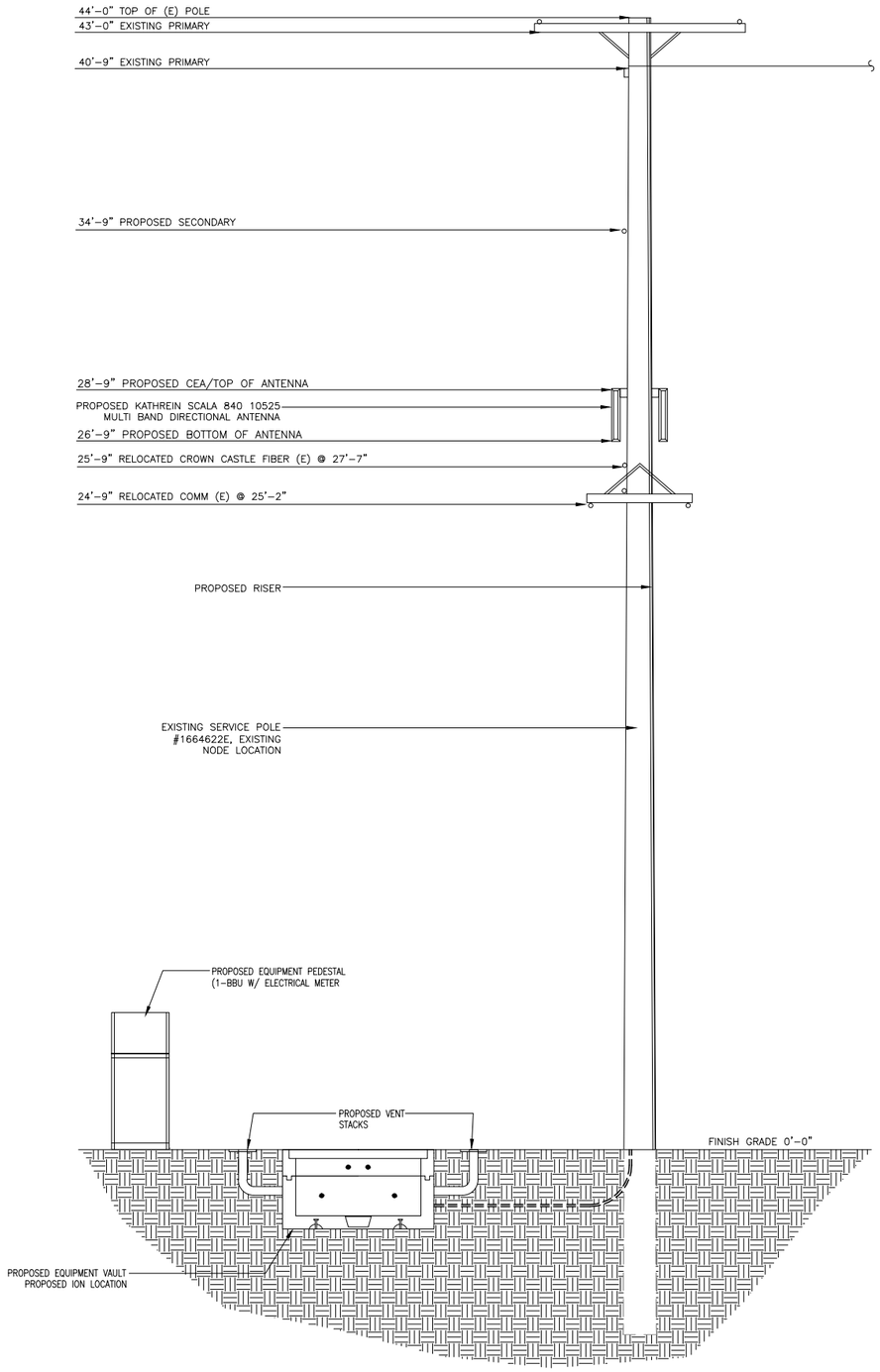
SANTA BARBARA, CA 93108
LAT: 34.43827°
LONG: -119.61056°

SHEET TITLE:
SITE PLAN AND ELEVATION

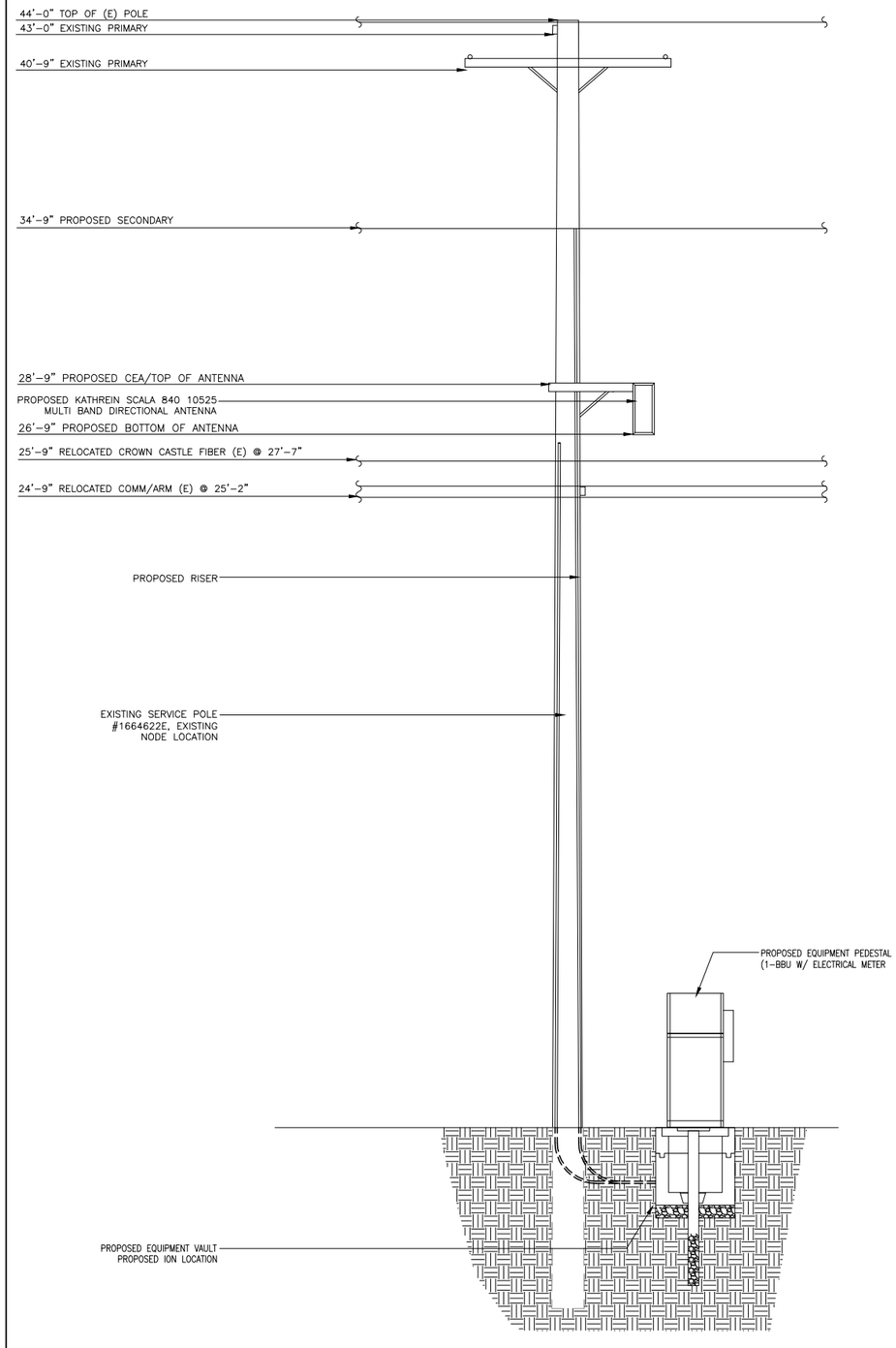
DRAWING INFO:
DRAWN BY: FC

SHEET NUMBER:
A-1



PROPOSED ELEVATION LOOKING NORTH

SCALE: 3/8"=1'-0" | 0 1' 2' 3' | 1



PROPOSED ELEVATION LOOKING WEST

SCALE: 3/8"=1'-0" | 0 1' 2' 3' | 2

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SANTA BARBARA, CA 93108

LAT: 34.43827°
LONG: -119.61056°

SHEET TITLE:

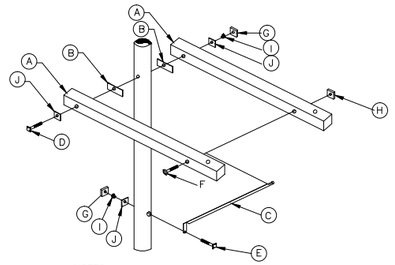
ELEVATION

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

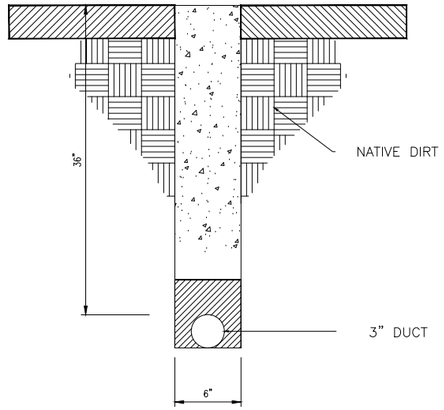
A-2



NOTES:
1. CROSS ARM AND BRACE MAY VARY IN LENGTH AND DIMENSION.
2. 5/8" MACHINE BOLTS WILL VARY DUE TO POLE DIAMETER.
3. ALL LINE HARDWARE TO BE HOT DIPPED GALVANIZED IRON.
4. BRACE MAY BE REVERSED DUE TO POLE CONDITIONS.

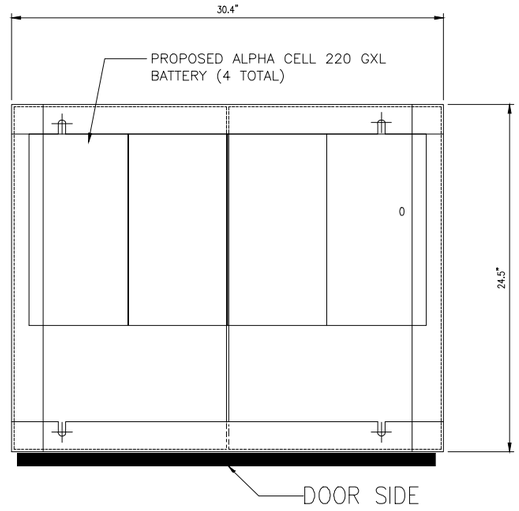
PARTS LIST		
CALLOUTS	QTY	DESCRIPTION
A	2	WOOD CROSS ARM 4" X 3 3/4" X 4 1/2"
B	2	GAIN PLATE 4 1/2" X 4 1/2"
C	1	EXTENSION ARM BRACE 47" X 1 3/4" X 3/16"
D	1	MACHINE BOLT 16" X 5/8"
E	1	MACHINE BOLT 14" X 5/8"
F	1	CARRIAGE BOLT 6" X 1/2"
G	2	SQUARE NUT 5/8"
H	1	SQUARE NUT 1/2"
I	2	DOUBLE COIL SPRING WASHER
J	3	FLAT SQUARE WASHER 2 1/4" X 2 1/4" X 3/16"

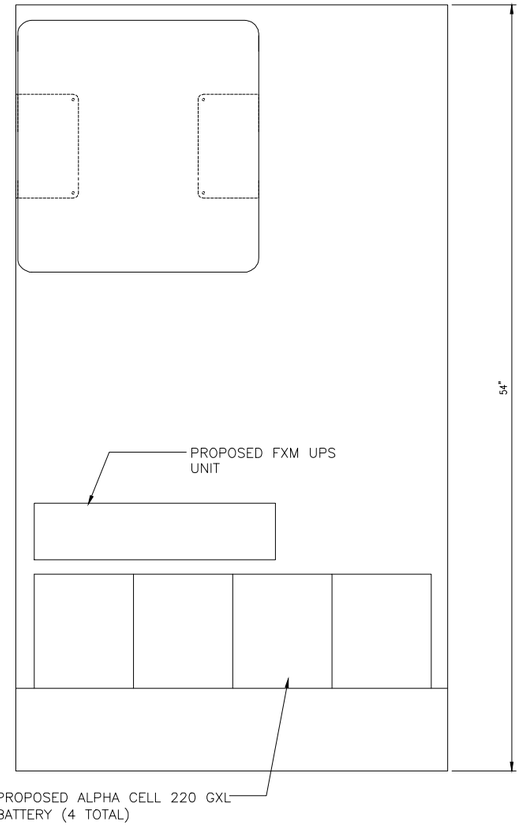
CROSS EXTENSION ARM N.T.S. **1**



* TRENCH TO BE BACK FILL WITH NATIVE MATERIAL & COMPACTED TO 90% OR BETTER & REPLACE LANDSCAPING IN KIND.

TRENCH DETAIL N.T.S. **3**





EQUIPMENT PEDESTAL N.T.S. **6**

Electrical

Power Supply
Mains power, Vac . . . . . 115 or 230
Power consumption, Watts . . . . . 1100 max.
< 750 @ normal operation

700 MHz SISO/MIMO

Frequency range, MHz
Uplink . . . . . 698 to 716/776 to 787
Downlink . . . . . 728 to 757

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
LTE	43	40**	37	34

850 MHz

Frequency range, MHz
Uplink . . . . . 824 to 849
Downlink . . . . . 869 to 894

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
Analog	43	40	37	34
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

20W for Cell, PCS bands and 700MHz MIMO

1900 MHz

Frequency range, MHz
Uplink . . . . . 1850 to 1915
Downlink . . . . . 1930 to 1995

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

CommScope®

ION-M7P/7P/85P/19P

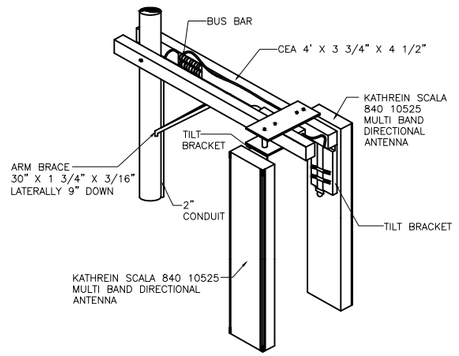
Noise figure, dB
ICP3 optimized . . . . . +10 max.
Noise figure optimized . . . . +6 max.
4.5 typical

Mechanical**

Height, width, depth, mm (in) . . . . . 817 x 245 x 218 (32.2 x 9.6 x 8.6)

Weight, kg (lb) 40 (88.2)

ION-M7P/7P/85P/19P N.T.S. **2**



ANTENNA CONFIGURATION N.T.S. **4**

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SHEET TITLE:
DETAILS

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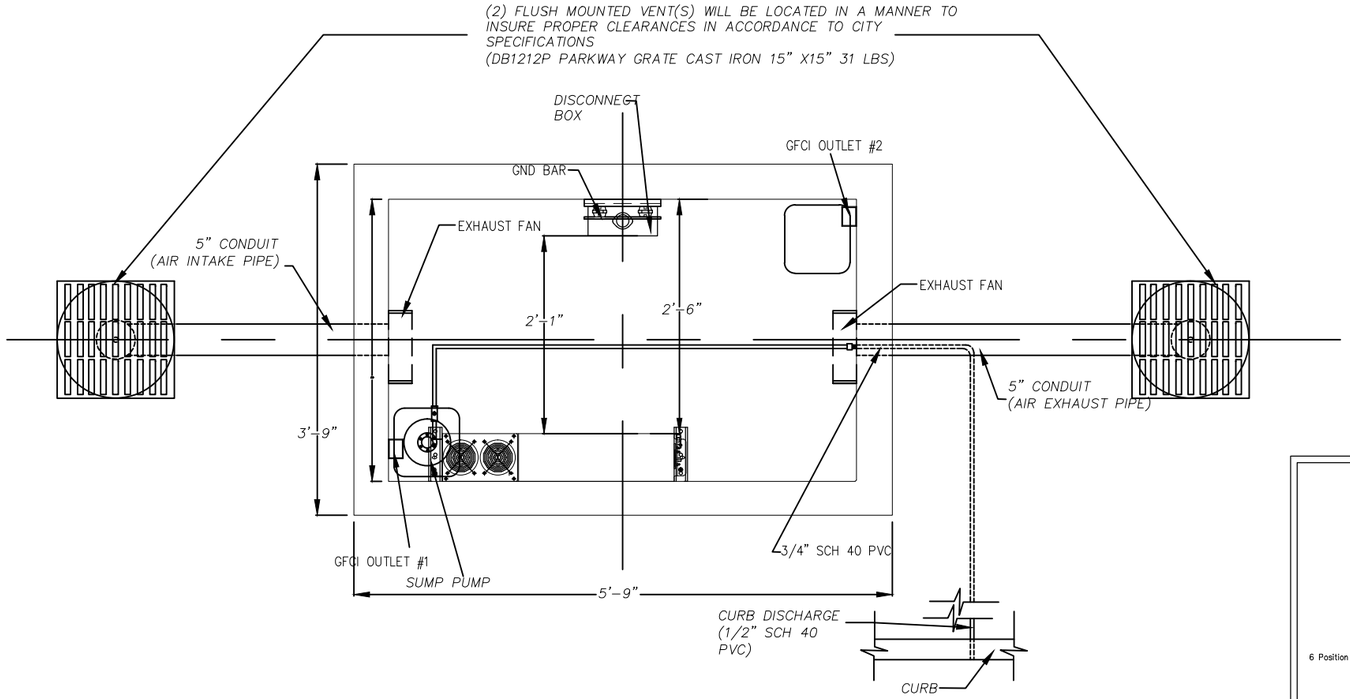
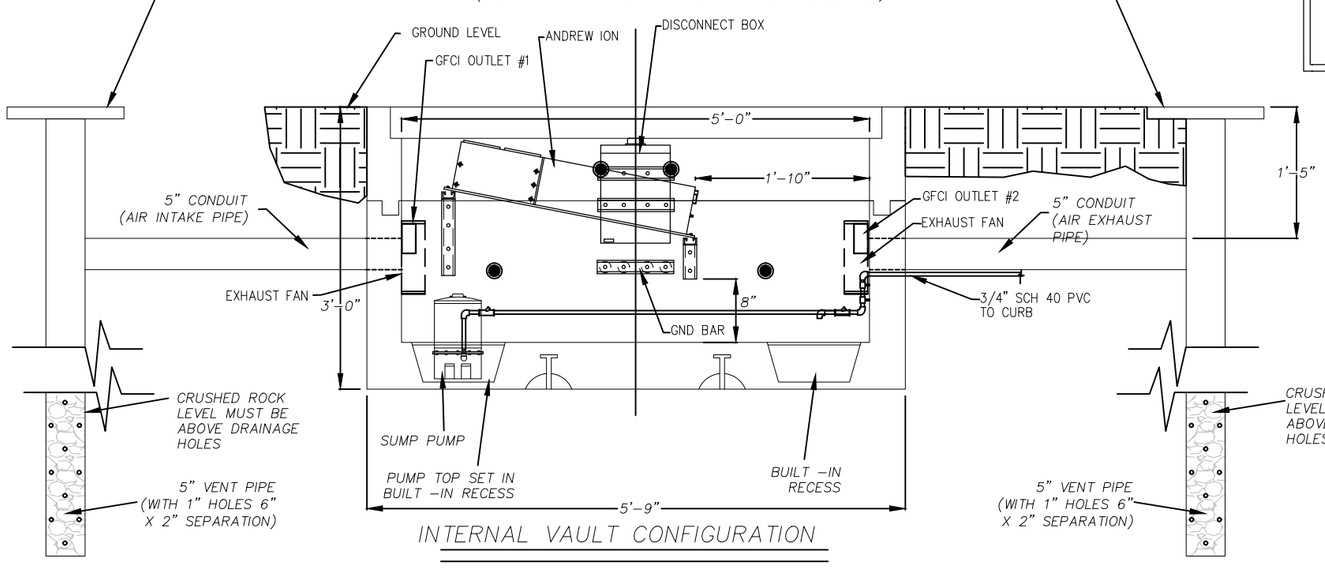
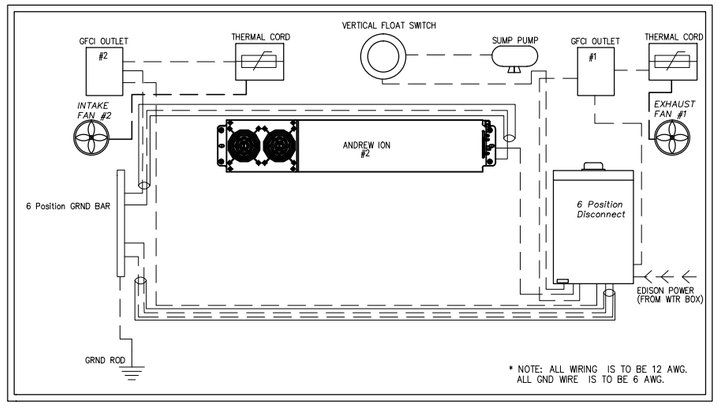




INTERNAL VAULT CONFIGURATION

WIRING SCHEMATIC



— — — GROUND WIRE (6 AWG)
— — — POWER WIRE (12 AWG)
1/2" LIQUIDTIGHT FLEX

* VENTS CAN BE FIELD CONFIGURED TO REDUCE OVER ALL FOOT PRINT AND AID REDUCING THE IMPACT ON THE SURROUNDING ENVIRONMENT.

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DETAILS

DRAWING INFO:

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FC

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D-2

ANTENNA SPECIFICATIONS

KATHREIN SCALA DIVISION

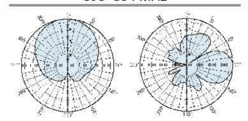
840 10525

65° Dualband Directional Antenna

Kathrein's multi-band antennas are ready for 4G applications, covering all existing wireless bands for AMPS, PCS and 3G/UMTS as well as all spectrum under consideration for future systems. These cross-polarized antennas offer diversity operation in the same space as a conventional 800 MHz antenna, and are mountable on our compact sector brackets.

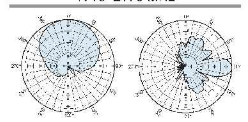
- Wide band operation.
- Exceptional intermodulation characteristics.
- High strength pultruded fiberglass radome.

698–894 MHz



Horizontal pattern ±45°-polarization (typical pattern) | Vertical pattern ±45°-polarization (typical pattern)

1710–2170 MHz



Horizontal pattern ±45°-polarization (typical pattern) | Vertical pattern ±45°-polarization (typical pattern)

General specifications:

Frequency range	698–894 MHz 1710–2170 MHz
Impedance	50 ohms
VSWR	<1.5:1
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Connector	4 x 7-16 DIN female
Isolation intrasystem	>30 dB
Weight	15.9 lb (7.2 kg) 20.3 lb (9.2 kg) clamps included
Dimensions	23.3 x 10.6 x 6.2 inches (593 x 270 x 157 mm)
Wind load Front/Side/Rear	at 93 mph (150kph) 37 lbf / 21 lbf / 56 lbf (163 N) / (92 N) / (245 N))
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	29 x 11.9 x 7.6 inches (736 x 302 x 192 mm)
Shipping weight	23.6 lb (10.7 kg)
Mounting	Fixed mounts for 2 to 4.6 inch (50 to 115 mm) OD masts are included. Tilt mount options are available.

See reverse for order information.

Specifications:	698–806 MHz	806–894 MHz	1710–1755 MHz	1850–1990 MHz	2110–2170 MHz
Gain	10.5 dBi	11 dBi	13.3 dBi	13.5 dBi	12.8 dBi
Front-to-back ratio	>25 dB (co-polar)	>25 dB (co-polar)	>30 dB (co-polar)	>30 dB (co-polar)	>30 dB (co-polar)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
-45° and -45° polarization horizontal beamwidth	71° (half-power)	68° (half-power)	61° (half-power)	63° (half-power)	70° (half-power)
-45° and -45° polarization vertical beamwidth	37° (half-power)	31° (half-power)	19° (half-power)	18° (half-power)	18.5° (half-power)
Cross polar ratio (typical) Main direction 0°	30 dB	30 dB	25 dB	25 dB	25 dB
Sector ±60°	>8 dB	>8 dB	>8 dB	>8 dB	>8 dB

11241-D

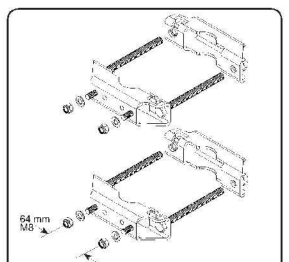
* Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

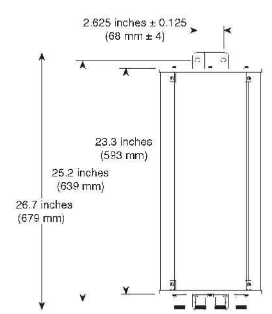
KATHREIN SCALA DIVISION

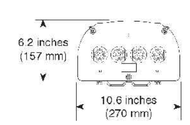
840 10525

65° Dualband Directional Antenna



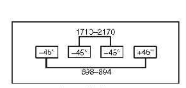
2 x 738 546 Mounting Kit (included)





Mounting Options:

Model	Description
2 x 738 546 (included)	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
850 10013	Tilt Kit for use with the 2 x 738 546 mounting kit 0–34 degrees downtilt angle.



Layout of interface

Profile PA3

Order Information:

Model	Description
840 10525	Antenna with 7-16 DIN connectors

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

N.T.S. 1

BATTERY SPECIFICATIONS

AlphaCell
General Specifications

Model:	220 GXL	195 GXL	165 GXL
Warranty[1]:	4 to 5 year full replacement	4 to 5 year full replacement	4 to 5 year full replacement
Service Life:	Extended	Extended	Extended
Runtime (minutes)[2]:	220	195	165
Sealed VRLA:	Valve regulated lead acid	Valve regulated lead acid	Valve regulated lead acid
Heat Resistant:	Extreme	Extreme	Extreme
Hydrogen Emission:	Low	Low	Low
Terminals:	Threaded insert 1/4" - 20 UNC	Threaded insert 1/4" - 20 UNC	Threaded insert 1/4" - 20 UNC

Specifications[4]

Model:	220 GXL	195 GXL	165 GXL
Typical Runtime (minutes)[2]:	220	195	165
Cells Per Unit:	6	6	6
Voltage Per Unit:	12.8	12.8	12.8
Conductance Value:	1175	1100	1000
Max. Discharge Current (A):	900	900	800
Short Circuit Current (A):	2800	2600	2500
10 Second Volts @ 100A:	11.4	11.3	11.2
Ohms Impedance 60Hz:	0.0050	0.0050	0.0055
Nominal Capacity at 20hrs: (to 1.75VPC)	109Ah	100Ah	86
Nominal Capacity at 20hrs: (to 1.70VPC)	110Ah	102Ah	87
BCI Group Size:	31	31	27
Weight (lb/kg):	73/33.2	67/30.5	63/28.6
Height w/ Terminals (in/mm):	8.48/215.4	8.48/215.4	8.05/204.5
Width (in/mm)[3]:	13.42/340.9	13.42/340.9	12.5/317.8
Depth (in/mm)[3]:	6.80/172.7	6.80/172.7	6.83/173.4
Operating Temperature Range Discharge:	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)
Charge (with temp compensation):	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)
Float Charging Voltage (Vdc):	13.5 to 13.8	13.5 to 13.8	13.5 to 13.8
AC Ripple Charger:	0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P		

Notes:
[1] Warranty varies by country and region. Warranty valid only when used with Alpha approved Power Supplies, Chargers and Enclosures. Consult your sales person for details.
[2] Runtimes calculated using a 25A DC constant current load.
[3] Dimensions at top of battery.
[4] See AlphaCell Users Guide for Additional Details.

Typical Standby Time in Minutes @ 25°C/77°F

XM2 90Vac@	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	508	453	396	320	285	249	236	209	193	186	165	144
4 batteries:	701	625	546	444	396	346	329	293	256	261	232	203
6 batteries:	1091	978	853	701	625	546	523	465	407	418	372	325
8 batteries:	1487	1338	1165	960	859	750	720	643	562	577	515	450
9 batteries:	1686	1519	1322	1091	978	853	820	735	640	659	587	514

XM2 90Vac@	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	149	132	115	119	106	92	101	89	77	87	73	66
4 batteries:	210	187	163	169	151	132	144	128	112	124	111	96
6 batteries:	339	301	264	275	245	211	235	209	183	204	182	159
8 batteries:	478	419	367	385	341	299	329	293	256	288	255	223
9 batteries:	538	479	419	440	391	342	377	335	294	329	293	256

XM2 60Vac@	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	798	712	622	508	453	396	377	335	294	300	267	233
4 batteries:	1091	978	853	701	625	543	523	435	407	418	372	325
6 batteries:	1686	1519	1322	1091	978	853	820	733	640	559	537	514
8 batteries:	2288	2067	1798	1487	1338	1165	1122	1006	877	904	809	706
9 batteries:	2590	2345	2087	1686	1519	1322	1273	1143	997	1027	921	803

XM2 60Vac@	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	242	215	188	196	174	151	166	148	125	144	128	107
4 batteries:	339	301	264	275	245	211	236	209	182	204	182	155
6 batteries:	538	479	419	440	391	340	377	335	290	329	293	252
8 batteries:	741	660	577	607	541	472	523	465	402	458	407	351
9 batteries:	843	753	658	692	617	538	597	531	462	523	435	402

* Above calculations based on an AC load with a .90 cable plant power factor.

For contact information visit www.alpha.com

The Alpha Group >

North America	Europe, Middle East & Africa			Asia Pacific	Latin & South America
Canada Tel: +1 604 430 1476 Fax: +1 604 430 8908 Toll Free: +1 800 667 8743	Cyprus Tel: +357 25 375 675 Fax: +357 52 359 595	Germany Tel: +49 9122 79389 0 Fax: +49 9122 79389 21	Lithuania Tel: +370 5 210 5291 Fax: +370 5 210 5292	P.R. China Tel: +852 2736 8663 Fax: +852 2199 7988	Contact USA office
USA Tel: +1 360 647 2360 Fax: +1 360 671 4936	Russia Tel: +7 495 925 9844 Fax: +7 495 916 1349	United Kingdom Tel: +44 1279 501110 Fax: +44 1279 659870			

049 297 10 B002 (06/09)

N.T.S. 2

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 01/31/2013	ISSUED FOR REVIEW
1	SA 03/19/2013	ISSUED FOR APPROVAL

ENGINEER/CONSULTANT:

Civil Engineer

CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON04
VERIZON MONTECITO–MON04

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C-1

ROW ADJACENT TO 617 OLIVE RD
SANTA BARBARA, CA 93108

LAT: 34.43827°
LONG: -119.61056°

SHEET TITLE:

DETAILS

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

D-3

Attachment 2

Antenna Specifications

KATHREIN
SCALA DIVISION

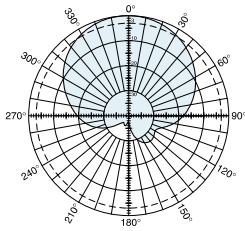
Preliminary **840 10525**

65° Dualband Directional Antenna

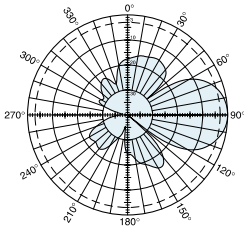
Kathrein's dual band antennas are ready for 3G applications, covering all existing wireless bands as well as all spectrum under consideration for future systems, LTE, PCS and 3G/UMTS. These cross-polarized antennas offer diversity operation in the same space as a conventional 700 MHz antenna, and are mountable on our compact sector brackets

- Wide band operation.
- Exceptional intermodulation characteristics.
- Various gain, beamwidth and downtilt ranges.
- High strength pultruded fiberglass radome.

698–894 MHz

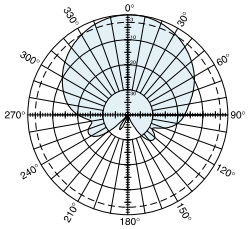


Horizontal pattern
±45°-polarization
(typical pattern)

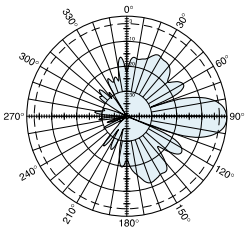


Vertical pattern
±45°-polarization
(typical pattern)

1710–2170 MHz



Horizontal pattern
±45°-polarization
(typical pattern)



Vertical pattern
±45°-polarization
(typical pattern)

General specifications:

Frequency range	698–894 MHz 1710–2170 MHz
Impedance	50 ohms
VSWR	<1.5:1
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Connector	4 x 7-16 DIN female
Isolation intrasystem	>30 dB
Weight	15.9 lb (7.2 kg)
Dimensions	22.8 x 10.3 x 5.5 inches (579 x 262 x 139 mm)
Wind load Front/Side/Rear	at 93 mph (150kph) 23 lbf / 18 lbf / 41 lbf (100 N) / (80 N) / (180 N)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	29 x 11.9 x 7.6 inches (736 x 302 x 192 mm)
Shipping weight	19.2 lb (8.7 kg)
Mounting	Fixed and tilt mount options are available for 2 to 4.6 inch (50 to 115 mm) OD masts.
See reverse for order information.	

Specifications:	**698–806 MHz**	**824–894 MHz**	**1710–1755 MHz**	**1850–1990 MHz**	**2110–2170 MHz**
Gain	10.5 dBi	11 dBi	12.5 dBi	13.3 dBi	13.6 dBi
Front-to-back ratio	>25 dB (co-polar)	>25 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	72° (half-power)	66° (half-power)	64° (half-power)	64° (half-power)	60° (half-power)
+45° and -45° polarization vertical beamwidth	37° (half-power)	34° (half-power)	19° (half-power)	18.5° (half-power)	18° (half-power)
Cross polar ratio Main direction 0° Sector ±60°	 30 dB (typical) >10 dB	 25 dB (typical) >10 dB	 25 dB (typical) >8 dB	 25 dB (typical) >8 dB	 25 dB (typical) >8 dB

* Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

RoHS Lead-Free

11241-FRO/a

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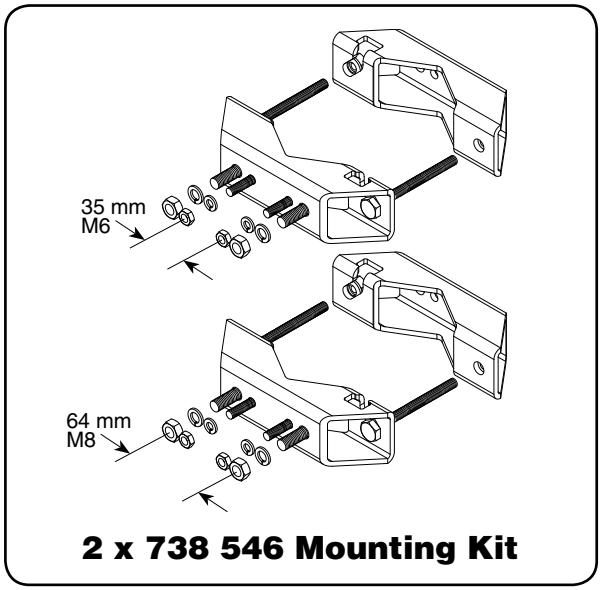
Email: communications@kathrein.com Internet: www.kathrein-scala.com

KATHREIN
SCALA DIVISION

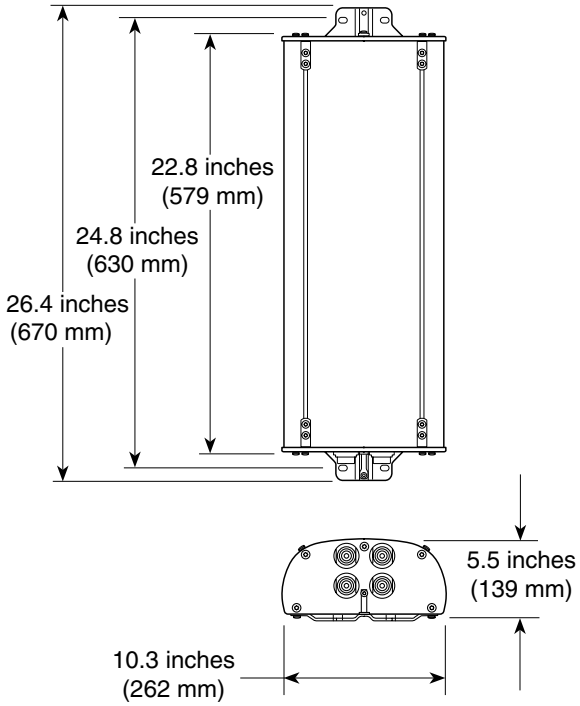
Preliminary

840 10525

65° Dualband Directional Antenna



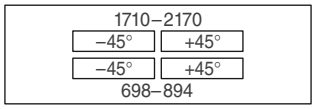
2 x 738 546 Mounting Kit



Profile PA2

Mounting Options:

Model	Description
2 x 738 546	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
850 10013	Tilt Kit for use with the 2 x 738 546 mounting kit 0–34 degrees downtilt angle.



Order Information:

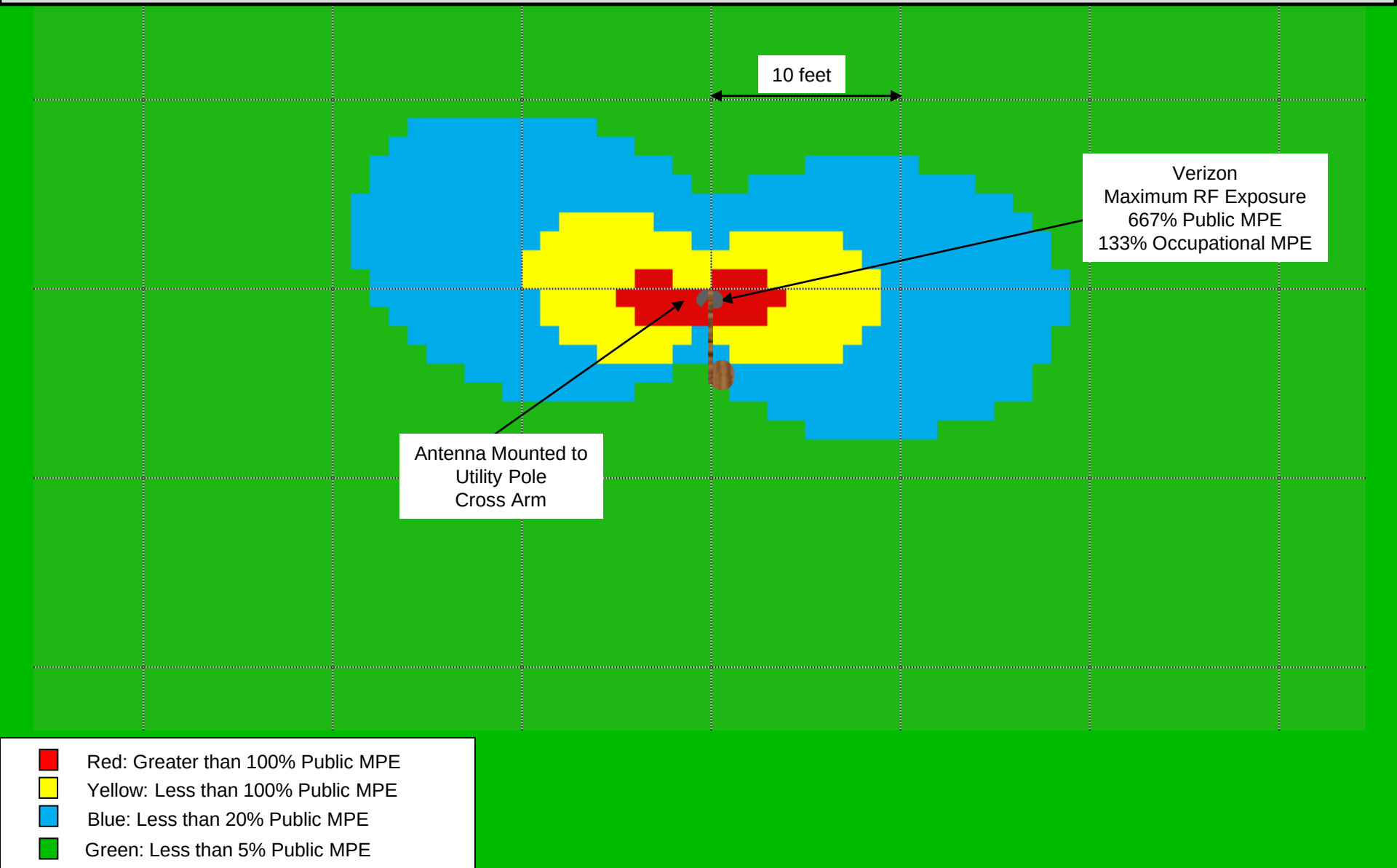
Model	Description
840 10525	Antenna with 7-16 DIN connectors

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

Appendix A-1

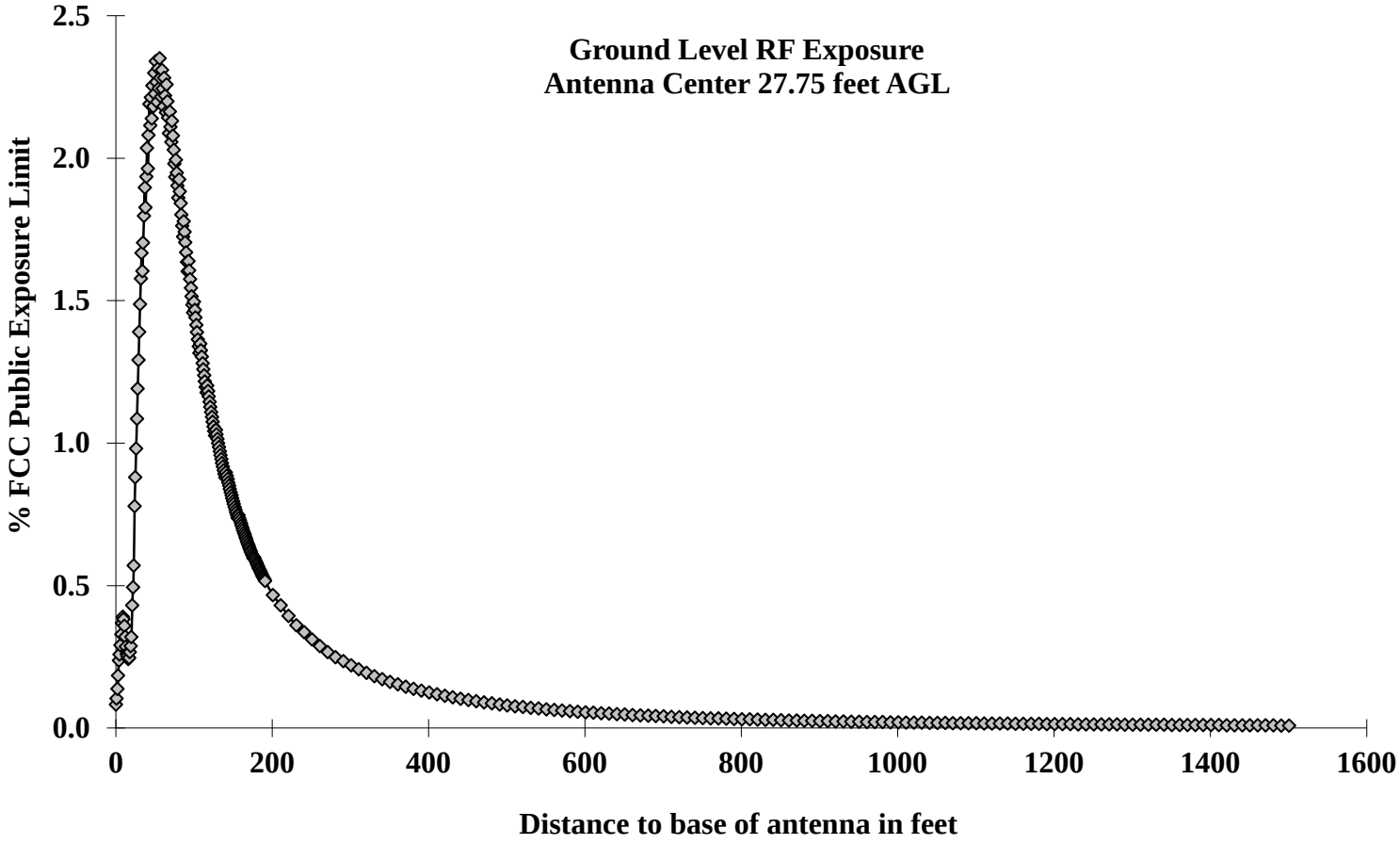
RF EXPOSURE AT ANTENNA LEVEL

RF EXPOSURE AT THE LEVEL OF THE ANTENNA
BASED ON PERCENTAGE OF FCC MAXIMUM
PUBLIC & OCCUPATIONAL EXPOSURE LIMIT



Appendix A-2

RF EXPOSURE AT GROUND LEVEL


Ground Level RF Exposure
Antenna Center 27.75 feet AGL
% FCC Public Exposure Limit
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
1600
Distance to base of antenna in feet

Appendix A-3

RF CAUTION SIGN

CAUTION

The radio frequency (RF) emissions at this site have been evaluated for potential RF exposure to personnel who may need to work near these antennae.

RF EXPOSURE AT 4 FEET OR CLOSER TO THE FACE OF THE ANTENNA *MAY EXCEED THE FCC PUBLIC EXPOSURE LIMITS.* RF EXPOSURE AT 2 FEET OR CLOSER TO THE FACE OF THE ANTENNA *MAY EXCEED THE FCC OCCUPATIONAL EXPOSURE LIMITS. OBEY ALL* SITE RF SAFETY GUIDELINES. ONLY QUALIFIED WORKERS THAT HAVE RF SAFETY TRAINING MAY WORK WITHIN THE PUBLIC EXCLUSION ZONE. ANYONE NEEDING TO WORK INSIDE THE EXCLUSION ZONE SHOULD CALL:1-866-639-8460 FOR INSTRUCTIONS PRIOR TO COMMENCING WORK. REFER TO SITE: _____

Reference: Federal Communications Commission (FCC) Public Exposure Standard. OET Bulletin-65, Edition 97-01, August 1997.

STATEMENT OF EXPERIENCE

Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM, FAAPM
(800) 760-8414 jbushberg@hampc.com

Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. In addition, Dr. Bushberg has extensive experience and lectures on several related topics including medical physics, radiation protection, (ionizing and non-ionizing), radiation biology, the science of risk assessment and effective risk communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University was on various aspects of the biological effects of microwave radiation. He has maintained a strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, the California Council on Science and Technology, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections. Dr. Bushberg has performed RF & ELF environmental field measurements and recommend appropriate mitigation measures for numerous transmission facilities in order to assure compliance with FCC and other safety regulations and standards. The consultation services provided by Dr. Bushberg are based on his professional judgement as an independent scientist, however they are not intended to necessarily represent the views of any other organization.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of nonionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of nonionizing electromagnetic radiation. Dr.Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurements (NCRP). He is also the Senior Scientific Vice-President of the NCRP and chairman of the NCRP Board of Directors. Dr. Bushberg has served as chair of the NCRP committee on Radiation Protection in Medicine and he continues to serve as a member of this committee as well as the NCRP scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based, in large part, on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of responsibility the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg also served for several years as a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the FCC and the FDA Center for Devices and Radiological Health.

Dr. Bushberg is a full member of the Bioelectromagnetics Society, the Health Physics Society and the Radiation Research Society. Dr. Bushberg received both a Masters of Science and Ph.D. from the Department of Bionucleonics at Purdue University. Dr. Bushberg is a fellow of the American Association of Physicists in Medicine and is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to California, Dr. Bushberg was on the faculty of Yale University School of Medicine.

JERROLD T. BUSHBERG Ph.D., DABMP, DABSNM, FAAPM
♦HEALTH AND MEDICAL PHYSICS CONSULTING♦

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(800) 760-8414–jbushberg@hampc.com

Bhavani Yella
Crown Castle
890 Tasman Drive
Milpitas, CA 95035

April 22, 2013

Introduction

At your request, I have reviewed the technical specifications and calculated the maximum potential radiofrequency, (RF), power density from the proposed Crown Castle (CC) Single Panel Distributed Antenna System (DAS) sites proposed for the right-of-way in Santa Barbara, CA. A DAS is a network of spatially separated antenna sites called "nodes" connected to a common source that provides wireless service within a geographic area. DAS antennae are typically installed near the top of light standards or on utility poles. The idea is to split the transmitted signal among several antenna sites, separated in space so as to provide coverage over the same area as a single antenna but with reduced total power and improved reliability. Thus a single antenna radiating at high power is replaced by a group (i.e., network) of low-power antennas to cover the same area. Some of the other advantages of DAS include the ability to provide service for multiple wireless carriers without the need to have separate antenna sites for each carrier at each location and the ability to place the antennae on existing vertical structures such as light or utility poles.

These proposed DAS nodes will utilize a single panel antennae mounted on the cross arm of utility poles. The antenna specified is Kathrien model 840-10525. The maximum effective radiated power (ERP) from the antennae will be up to 173.8 watts at approximately 775 MHz utilizing LTE transmission technology; 97.7 watts at approximately 850 MHz and 173.78 watts at approximately 1,900 MHz utilizing CDMA/EVDO transmission technology. The distance from the antenna center to the ground will be at least 30 feet. A list of the proposed DAS node locations and an example of the site configuration are shown in attachment one. The antenna specification details are depicted in attachment two. This analysis represents the worst case RF exposure of any of the proposed utility pole mounted DAS node locations.

Calculation Methodology

Calculations at the level of the antenna were made in accordance with the cylindrical model recommendations for near-field analysis contained in the Federal Communications Commission, Office of Engineering and Technology Bulletin 65 (OET 65) entitled "Evaluating Compliance with FCC-Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." RF exposure calculations at ground level were made using equation 10 from the same OET document. Several assumptions were made in order to provide the most conservative or "worst case" projections of power densities. Calculations were made assuming all channels were operating simultaneously at their maximum design effective radiated power. Attenuation (weakening) of the signal that would result from surrounding foliage or buildings was ignored. Buildings or other structures can reduce the signal strength by a factor of 10 (i.e., 10 dB) or more depending upon the construction material.

In addition, for ground level calculations, the ground or other surfaces were considered to be perfect reflectors (which they are not) and the RF energy was assumed to overlap and interact constructively at all locations (which they would not) thereby resulting in the calculation of the maximum potential exposure. In fact, the accumulations of all these very conservative assumptions, will significantly overestimate the actual exposures that would typically be expected from such a facility. However, this method is a prudent approach that errs on the side of safety.

RF Safety Standards

The two most widely recognized standards for protection against RF field exposure are those published by the American National Standards Institute (ANSI) C95.1 and the National Council on Radiation Protection and measurement (NCRP) report #86. The NCRP is a private, congressionally chartered institution with the charge to provide expert analysis of a variety of issues (especially health and safety recommendations) on radiations of all forms. The scientific analyses of the NCRP are held in high esteem in the scientific and regulatory community both nationally and internationally. In fact, the vast majority of the radiological health regulations currently in existence can trace their origin, in some way, to the recommendations of the NCRP.

All RF exposure standards are frequency-specific, in recognition of the differential absorption of RF energy as a function of frequency. The most restrictive exposure levels in the standards are associated with those frequencies that are most readily absorbed in humans. Maximum absorption occurs at approximately 80 MHz in adults. The NCRP maximum allowable continuous occupational exposure at this frequency is 1,000 $\mu W/cm^2$. This compares to 2,933 $\mu W/cm^2$ at cellular frequencies and 5,000 $\mu W/cm^2$ at PCS frequencies that are absorbed much less efficiently than exposures in the VHF TV band.

The traditional NCRP philosophy of providing a higher standard of protection for members of the general population compared to occupationally exposed individuals, prompted a two-tiered safety standard by which levels of allowable exposure were substantially reduced for "uncontrolled " (e.g., public) and continuous exposures. This measure was taken to account for the fact that workers in an industrial environment are typically exposed no more than eight hours a day while members of the general population in proximity to a source of RF radiation may be exposed continuously. This additional protection factor also provides a greater margin of safety for children, the infirmed, aged, or others who might be more sensitive to RF exposure. After several years of evaluating the national and international scientific and biomedical literature, the members of the NCRP scientific committee selected 931 publications in the peer-reviewed scientific literature on which to base their recommendations. The current NCRP recommendations limit continuous public exposure at cellular frequencies (e.g., ~820MHz) to 550 $\mu W/cm^2$ and to 1,000 $\mu W/cm^2$ at PCS frequencies (~1,900 MHz).

The 1992 ANSI standard was developed by Scientific Coordinating Committee 28 (SCC 28) under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). This standard, entitled "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991), was issued in April 1992 and subsequently adopted by ANSI. A revision of this standard (C95.1-2005) was completed in October 2005 by SCC 39 the IEEE International Committee on Electromagnetic Safety. Their recommendations are similar to the NCRP recommendations for the maximum permissible exposure (MPE) to the public PCS frequencies (950 $\mu W/cm^2$ for continuous exposure at 1,900 MHz) and incorporates the convention of providing for a greater margin of safety for public as compared with occupational exposure. Higher whole body exposures are allowed for brief periods provided that no 30 minute time-weighted average exposure exceeds these aforementioned limits.

On August 9, 1996, the Federal Communications Commission (FCC) established a RF exposure standard that is a hybrid of the current ANSI and NCRP standards. The maximum permissible exposure values used to assess environmental exposures are those of the NCRP (i.e., maximum public continuous exposure at cellular and PCS frequencies of 550 $\mu W/cm^2$ and 1,000 $\mu W/cm^2$ respectively). The FCC issued these standards in order to address its responsibilities under the National Environmental Policy Act (NEPA) to consider whether its actions will "significantly affect the quality of the human environment." In as far as there was no other standard issued by a federal agency such as the Environmental Protection Agency (EPA), the FCC utilized their rulemaking procedure to consider which standards should be adopted. The FCC received thousands of pages of comments over a three-year review period from a variety of sources including the public, academia, federal health and safety agencies (e.g., EPA & FDA) and the telecommunications industry. The FCC gave special consideration to the recommendations by the federal health agencies because of their special responsibility for protecting the public health and safety. In fact, the MPE values in the FCC standard are those recommended by EPA and FDA. The FCC standard incorporates various elements of the 1992 ANSI and NCRP standards which were chosen because they are widely accepted and technically supportable. There are a variety of other exposure guidelines and standards set by other national and international organizations and governments, most of which are similar to the current ANSI/IEEE or NCRP standard, figure one.

The FCC standards "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation" (Report and Order FCC 96-326) adopted the ANSI/IEEE definitions for controlled and uncontrolled environments. In order to use the higher exposure levels associated with a controlled environment, RF exposures must be occupationally related (e.g., wireless company RF technicians) and they must be aware of and have sufficient knowledge to control their exposure. All other environmental areas are considered uncontrolled (e.g., public) for which the stricter (i.e., lower) environmental exposure limits apply. All carriers were required to be in compliance with the new FCC RF exposure standards for new telecommunications facilities by October 15, 1997. These standards applied retroactively for existing telecommunications facilities on September 1, 2000.

The task for the physical, biological, and medical scientists that evaluate health implications of the RF data base has been to identify those RF field conditions that can produce harmful biological effects. No panel of experts can guarantee safe levels of exposure because safety is a null concept, and negatives are not susceptible to proof. What a dispassionate scientific assessment can offer is the presumption of safety when RF-field conditions do not give rise to a demonstrable harmful effect.

Summary & Conclusions

All CC utility pole DAS nodes listed in attachment one, operating with the characteristics as specified above and observing an six foot (public) and three foot (occupational) exclusion zone directly in front of and at the same elevation as the antenna, will be in full compliance with FCC RF public and occupational safety exposure standards. These transmitters, by design and operation, are low-power devices. Even under maximal exposure conditions in which the antenna is transmitting at its greatest design basis ERP, the maximum exposure at the elevation of the antenna will not result in RF exposures in excess of the FCC public RF safety standard at six or more feet from the surface of the antenna, (see appendix A-1). The maximum RF exposure at ground level will not be in excess of 4.0% of, (i.e., 25 times lower than), the FCC public safety standard, (see appendix A-2).

A chart of the electromagnetic spectrum and a comparison of RF power densities from various common sources is presented in figures two and three respectively in order to place exposures from DAS wireless

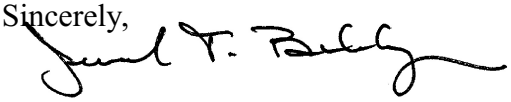
systems in perspective. RF exposure in the neighborhood served by this and other DAS sites are very low due to three main factors. First, as previously stated, DAS is a relatively low-power technology. The maximum power into the antenna will be less than 445.3 watts. In addition, DAS sites utilize directional antennae that focus the RF energy toward the horizon, (i.e., parallel with the ground at the level of the antenna), thus only a very small percentage of the RF energy is emitted directly down toward the ground. This is similar to a lighthouse beacon that sends the majority of its light out toward the horizon with very little reaching the base of the lighthouse or people living nearby. Finally, as shown on the graph in appendix A-2, as one gets farther away from the site, the change in RF exposure intensity becomes more uniform with distance. Eventually there is a very rapid and consistent decrease in exposure with distance. Like all forms of electromagnetic energy, including light, the decrease in exposure at this point is proportional to the square of the increased distance. Thus, if the exposure at this point was 1% of the public exposure standard and one simply moved 10 times further away, (all other conditions being the same), the exposure would be 10^2 or 100 times less than before (i.e., 0.01% of the public exposure standard).

It is also important to realize that the FCC maximum allowable exposures are not set at a threshold between safety and known hazard but rather at 50 times below a level that the majority of the scientific community believes may pose a health risk to human populations. Thus, the previously mentioned maximum ground level exposure from these sites represents a "safety margin" from this threshold of potentially adverse health effects of more than 1,250 times.

Given the low levels of radiofrequency fields that would be generated from these CC directional antenna installations and given the evidence on RF biological effects in a large data base, there is no scientific basis to conclude that harmful effects will attend the utilization of this proposed wireless telecommunications facility. This conclusion is supported by a large number of scientists that have participated in standard-setting activities in the United States who are overwhelmingly agreed that RF radiation exposure below the FCC exposure limits has no demonstrably harmful effects on humans. An RF caution sign, containing appropriate contact information and indicating the stay back distance beyond which the RF exposures do not exceed the public and occupational maximum permissible exposure (MPE), should be placed near the antenna (see appendix A-3).

These findings are based on my professional evaluation of the scientific issues related to the health and safety of non-ionizing electromagnetic radiation and my analysis of the technical specification as provided by CC. The opinions expressed herein are based on my professional judgement and are not intended to necessarily represent the views of any other organization or institution. Please contact me if you require any additional information.

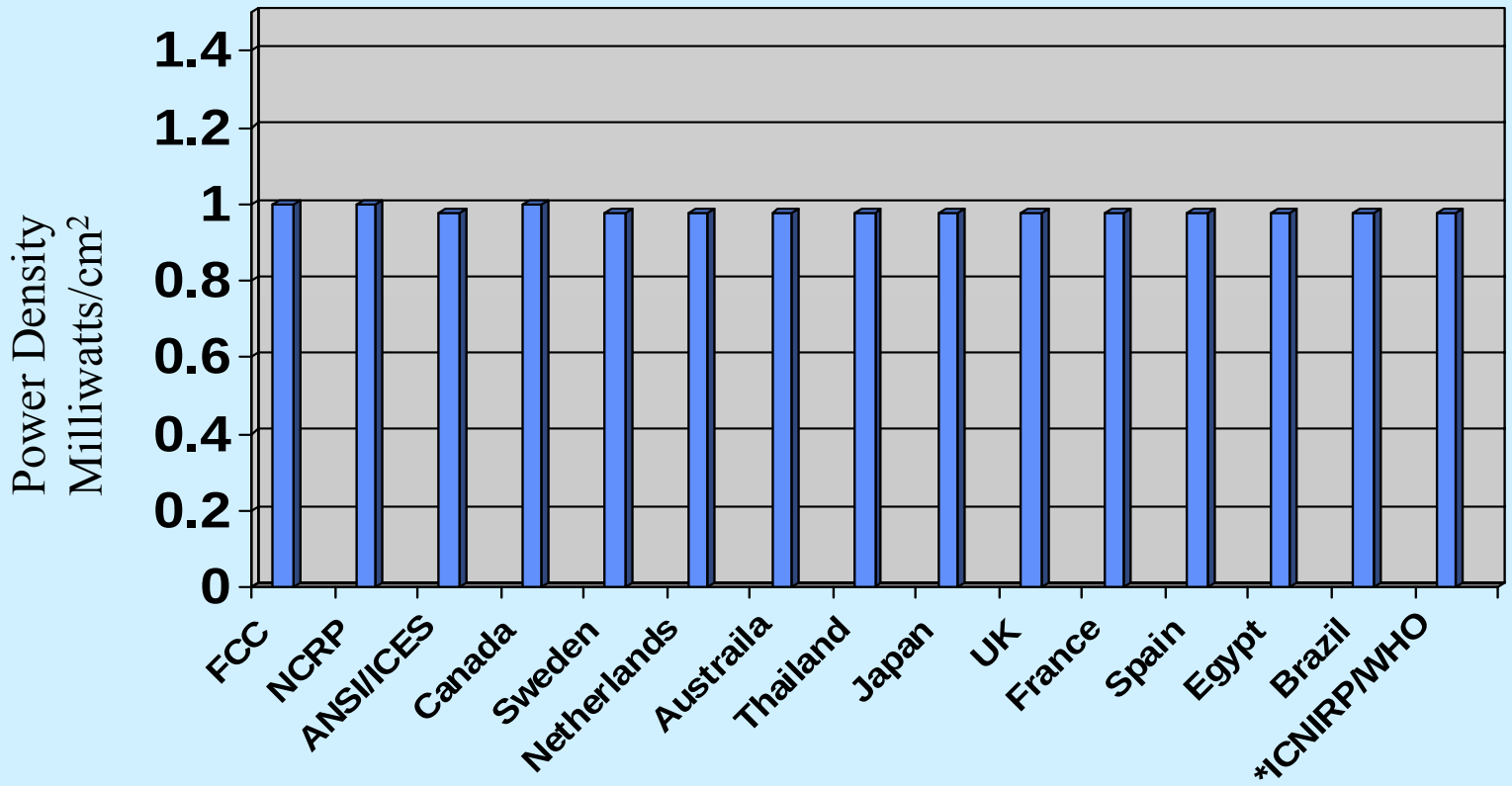
Sincerely,



Jerrold T. Bushberg Ph.D., DABMP, DABSNM
Diplomate, American Board of Medical Physics (DABMP)
Diplomate, American Board of Science in Nuclear Medicine (DABSNM)
Fellow, American Association of Physicists in Medicine (FAAPM)

Enclosures: Figures 1-3; Attachment 1,2; Appendices A1-A3 and Statement of Experience.

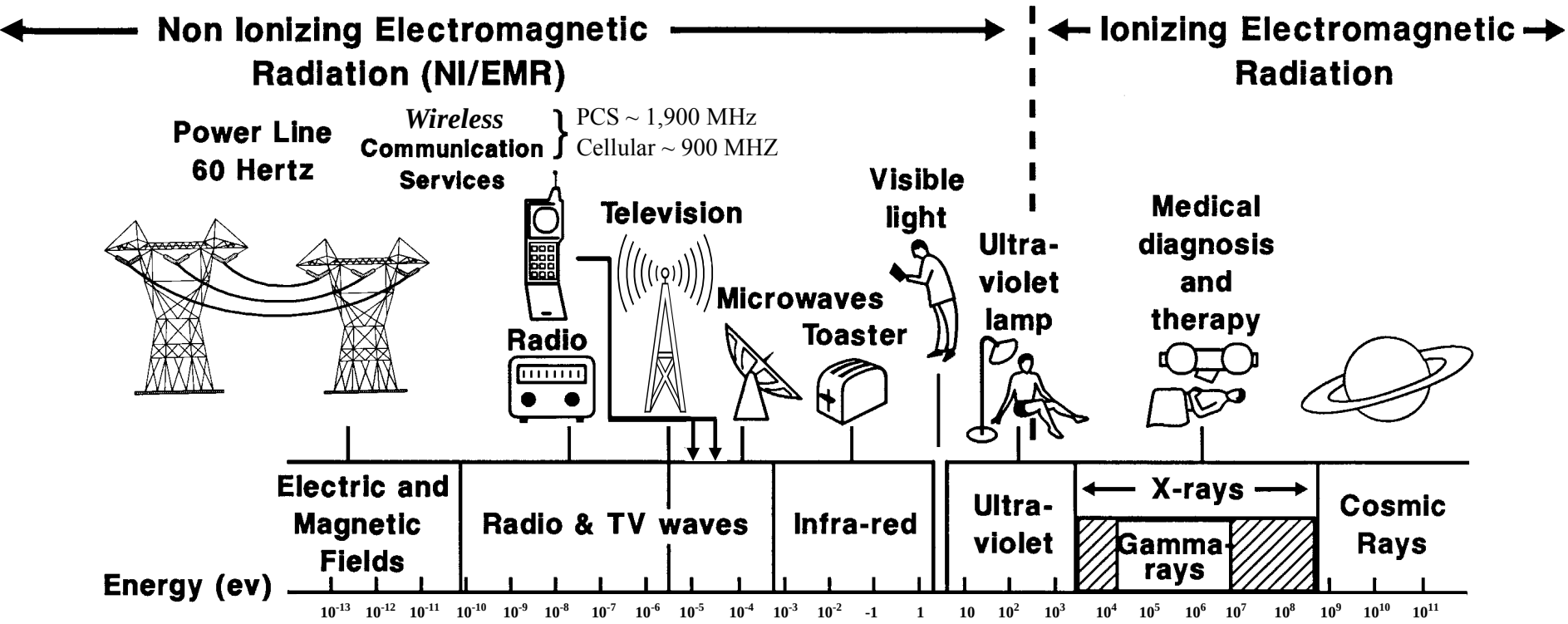
National and International Public RF Exposure Standards (DAS @ 1,950 MHz)



***International Commission on Non-Ionizing Radiation Protection (ICNIRP) Public Safety Exposure Standard. ICNIRP standard recommended by the World Health Organization (WHO). Members of the ICNIRP Scientific Committee were from:**

- **Australia**
- **Finland**
- **France**
- **Germany**
- **Hungary**
- **Italy**
- **Sweden**
- **Japan**
- **United Kingdom**
- **United States**

Figure 1



The Electromagnetic Spectrum

Figure 2

Typical Exposure from Various Radio Frequency / Microwave Sources

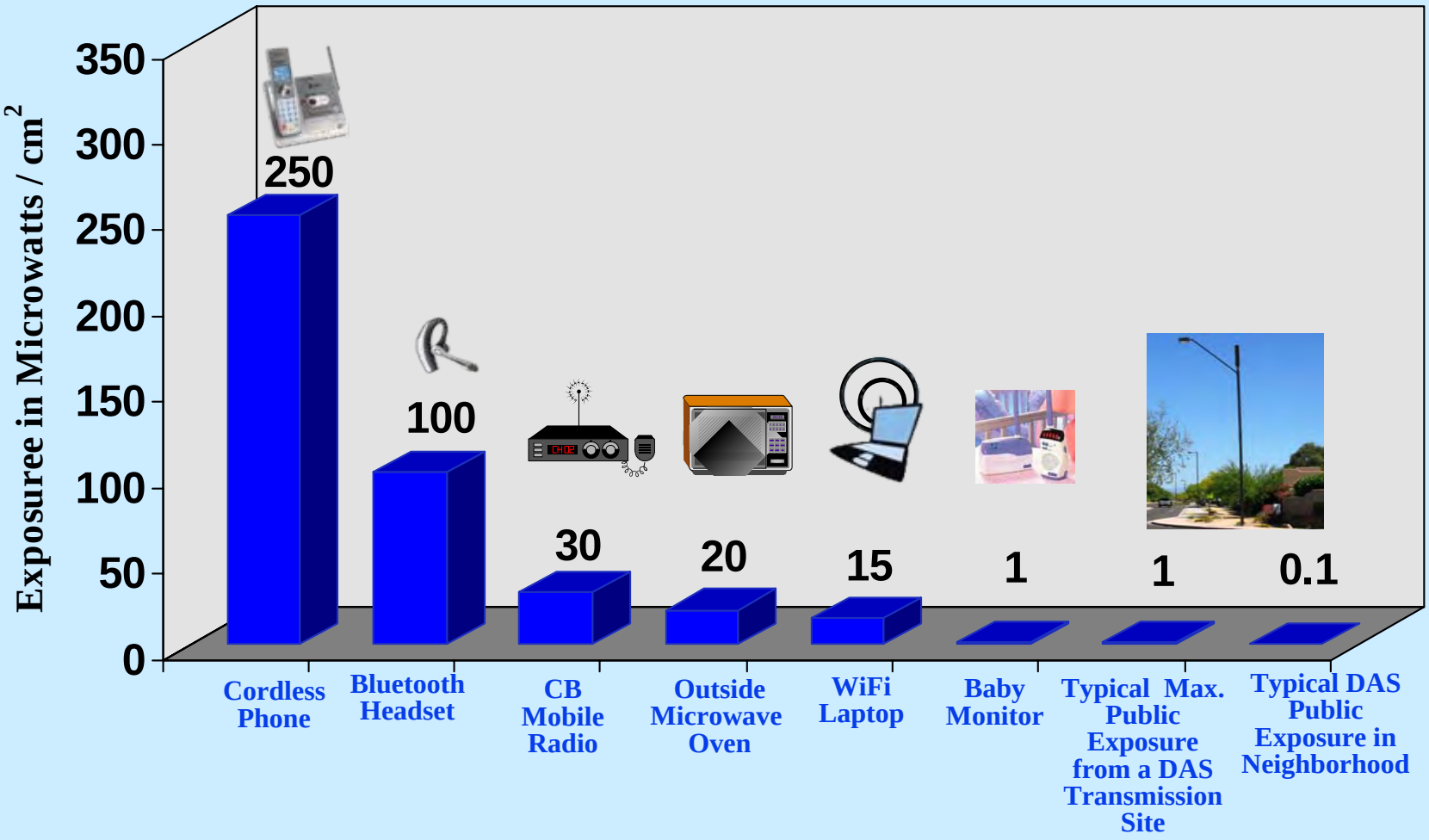


Figure 3

Attachment 1

List of Proposed Utility Pole Single Panel Antenna DAS Node Locations and Example of DAS Single Panel Antenna Mounted to Utility Pole

Proposed Remote Site Item #	Proposed Remote Location(s) or Site ID	Proposed Antenna Rad Center (AGL) (feet)	Azimuth for Antenna #1		Street Address/cross street	Antenna Type
Configuration #1: 1 Kathrein Scala 840 10525 Panel Antenna						
1	MON01	36'	250		563 Sheffield Dr, SB, CA, 93108	1 Kathrein Scala 840 10525
10	MON10	30'	205		2110 E. Valley Dr, SB, CA, 93108	1 Kathrein Scala 840 10525
30	MON30	35'	230		1764 San Leandro Ln, SB, CA, 93108	1 Kathrein Scala 840 10525

CROWN CASTLE NG WEST, INC

VERIZON MONTECITO-MON10

R.O.W. NORTH SIDE OF EAST VALLEY RD (ADJACENT TO 2110 EAST VALLEY RD) SANTA BARBARA, CA 93108

GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A PERMIT HAS BEEN ISSUED.
2. UPON ISSUANCE OF A PERMIT, NO WORK WILL BE PERMITTED ON WEEKENDS OR HOLIDAYS WITHOUT PERMISSION FROM THE ENGINEERING DEPARTMENT.
3. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY THE LOCAL JURISDICTION DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR CITY LAWS, ORDINANCES, REGULATIONS, OR POLICIES, INCLUDING, BUT NOT LIMITED TO, THE FEDERAL ENDANGERED SPECIES ACT OF 1973 AND AMENDMENTS THERETO (16 USC SECTION 1531 ET.SEQ.).
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, SUCH MONUMENTS SHALL BE REPLACED WITH APPROPRIATE MONUMENTS BY A LAND SURVEYOR, A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FIELD AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE LOCAL JURISDICTION FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
5. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER BE ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TWO DAYS BEFORE YOU DIG.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
7. CONTRACTOR SHALL SUBMIT TO THE LOCAL JURISDICTION, A CONSTRUCTION PLAN TO PROTECT WATER MAINS PRIOR TO COMMENCING CONSTRUCTION.
8. CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUIT, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
9. CONTRACTOR SHALL NOTIFY THE LOCAL JURISDICTION. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING WORK WITHIN 10' OF ALL SEWER, WATER, AND STORMDRAIN MAIN INCLUDING ALL CROSSINGS.
10. THIS PROJECT WILL BE INSPECTED BY ENGINEERING AND CAPITAL PROJECTS DEPARTMENT, FIELD ENGINEERING DIVISION.
11. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY RESIDENT ENGINEER PRIOR TO THE ACCEPTANCE OF THIS PROJECT.
12. PUBLIC IMPROVEMENT SUBJECT TO DESUETUDE OR DAMAGE." IF REPAIR OR REPLACEMENT OF SUCH PUBLIC IMPROVEMENTS IS REQUIRED, THE OWNER SHALL OBTAIN THE REQUIRED PERMITS FOR WORK IN THE PUBLIC RIGHT-OFWAY, SATISFACTORY TO THE PERMIT – ISSUING AUTHORITY.
13. PRIOR TO ANY DISTURBANCE TO THE SITE, EXCLUDING UTILITY MARKS-OUTS AND SURVEYING, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRE-CONSTRUCTION MEETING WITH THE LOCAL JURISDICTION FIELD ENGINEERING DIVISION.
14. PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION SHOWN ON THESE PLANS. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE. THE CONTRACTOR IS RESPONSIBLE TO ATTEND THE LOCAL JURISDICTIONS MONTHLY UTILITY COORDINATION COMMITTEE THE CONSTRUCTION ACTIVITIES WITH THE CITY AND ALL OTHER CONTRACTORS SO THAT NO TRENCH IS CUT WITHIN ANY OF THE CITY STREETS THAT HAVE BEEN CONSTRUCTED, REPAIRED, OR SLURRY SEALED WITHIN THREE YEARS OF THE STREET CONSTRCTUION/RESURFACING DATE.
15. MANHOLES OR COVERS SHALL BE LABELED "CROWN CASTLE" OR "CROWN CASTLE NG WEST".
16. CONTRACTOR SHALL IMPLEMENT AN EROSION AND SEDIMENT CONTROL PROGRAM DURING THE PROJECT CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL MEET THE APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCE CONTROL BOARD.
17. THE CONTRACTOR SHALL HAVE EMERGENCY MATERIALS AND EQUIPMENT ON HAND FOR UNFORESEEN SITUATIONS, SUCH AS DAMAGE TO UNDERGROUND WATER, SEWER, AND STORM DRAIN FACILITIES WHEREBY FLOWS MAY GENERATE EROSION AND SEDIMENT POLLUTION.

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE CITY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF THESE NOTES AND THE CITY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1. THE CONTRACTOR SHALL VERIFY THE LOCATION EXISTING UNDERGROUND UTILITIES INCLUDING SEWER LATERALS AND WATER SERVICES TO INDIVIDUAL LOTS BOTH VERTICAL AND HORIZONTAL PRIOR TO COMMENCING IMPROVEMENT OPERATIONS.
2. CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS OF PLANS IF REVISION IS NECESSARY BECAUSE OF LOCATION OF EXISTING UTILITIES.
3. LOCATION AND ELEVATIONS OF IMPROVEMENTS, TO BE MET BY WORK, SHALL BE CONFIRMED BY FIELD MEASUREMENT PRIOR TO CONSTRUCTION OF NEW WORK.
4. GRADES SHOWN ARE FINISH GRADES, CONTRACTOR SHALL DETERMINE NECESSARY SUB GRADE ELEVATIONS AND SHALL CONSTRUCT SMOOTH TRANSITION BETWEEN FINISH GRADES SHOWN.
5. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITION DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS PROVISION SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXPECTING FOR LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
6. THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR COMPLIANCE WITH THE PROVISIONS OF THE STATE OF CALIFORNIA SAFETY ORDERS.
7. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FROM EXISTING RECORDS AND CORROBORATED, WHERE POSSIBLE WITH FIELD TIES. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE LOCATIONS SHOWN, BOTH HORIZONTALLY AND VERTICALLY, PRIOR TO CONSTRUCTION. IF EXISTING LOCATIONS VARY SUBSTANTIALLY FROM THE PLANS, THE ENGINEER SHOULD BE NOTIFIED TO MAKE ANY CONSTRUCTION CHANGES REQUIRED.
8. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT FOR ALL SEWER AND WATER MAIN UNDER CROSSING IN ACCORDANCE WITH PART 1 SECTION 5-2 OF THE STANDARD SPECIFICATION.
9. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUITS, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL SUBMIT WORK PLANS FOR ALL BORE OPERATIONS TWO WEEKS PRIOR TO COMMENCING WORK.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
12. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT.

VICINITY MAP – N.T.S.

GROUND BUS BAR
MECH. GRND. CONN.
CADWELD
ELECTRIC BOX
TELEPHONE BOX
EXISTING SERVICE POLE
SIDEWALK FLAG
EX. MANHOLE
LIGHT POLE
FOUNDATION
SPOT ELEV.
SET POINT
REVISION
DETAIL REF.
ELEVATION REF.
SECTION REF.
PROP./LEASE LINE
MATCH LINE
WORK POINT
TELE. CONDUIT
CENTERLINE
ELECT. CONDUIT
COAXIAL CABLE
MYERS PEDESTAL
VAULT STANDARD 2'X3'
STEEL POLE

SYMBOLS, LINETYPES AND HATCH PATTERNS

EROSION AND SEDIMENT CONTROL NOTES

TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE LOCAL JURISDICTION "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED GRADING/IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER AND/OR WATER POLLUTION CONTROL PLAN (WPCP).
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. FOR INLETS LOCATED AT SUMPS ADJACENT TO TOP OF SLOPES, THE CONTRACTOR SHALL ENSURE THAT WATER DRAINING TO THE SUMP IS DIRECTED INTO THE INLET AND THAT A MINIMUM OF 1.00" FREEBOARD EXISTS AND IS MAINTAINED ABOVE THE TOP OF THE INLET. IF FREEBOARD IS NOT PROVIDED BY GRADING SHOWN ON THESE PLANS, THE CONTRACTOR SHALL PROVIDE IT VIA TEMPORARY MEASURES, I.E. GRAVEL BAGS OR DIKES.
4. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR OR QUALIFIED PERSON SHALL CHECK AND MAINTAIN ALL LINED AND UNLINED DITCHES AFTER EACH RAINFALL.
6. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
7. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON, ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
8. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL MEASURES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
9. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
11. ALL EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED GRADING PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
12. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
13. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
14. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDIMENT CONTROL MEASURES.
15. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

TRAFFIC CONTROL NOTES

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN (11" X 17") FOR APPROVAL PRIOR TO STARTING WORK. THE PLAN SHOULD BE SUBMITTED TO THE TRAFFIC CONTROL PERMIT COUNTER. CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO STARTING WORK, AND A MINIMUM FIVE (5) DAYS IF WORK WILL AFFECT A BUS STOP OR AN EXISTING TRAFFIC SIGNAL, OR IF WORK WILL REQUIRE A ROAD OR ALLEY CLOSURE.

FOOTAGE TOTALS	
ASPHALT CUT	–
DIRT TRENCH	–
PUNCH THRU	–
BORE	–
TOTAL	–
R&R SWF TOTAL	–

PROJECT DICTIONARY

SITE ADDRESS: R.O.W. NORTH SIDE OF EAST VALLEY RD (ADJACENT TO 2110 EAST VALLEY RD) SANTA BARBARA, CA 93108

APPLICANT: CROWN CASTLE NG WEST, INC
2125 WRIGHT AVE, SUITE #C9
LA VERNE, CA 91750
CONTACT: DANIEL NUESKE
PHONE: (714) 472-1577

CIVIL ENGINEER: CONNELL DESIGN GROUP, LLC
26455 RANCHO PARKWAY SOUTH
LAKE FOREST, CA 92630
CONTACT: FRANK CARTER
(949) 310-8233 PHONE
(949) 753-8833 FAX

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS

APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

*2010 CALIFORNIA BUILDING CODE
*2010 CALIFORNIA MECHANICAL CODE
*2010 CALIFORNIA PLUMBING CODE
*2010 CALIFORNIA ELECTRICAL CODE

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

PROJECT DESCRIPTION

PROJECT CONSISTS OF INSTALLATION OF:

1. PANEL ANTENNA ON EXISTING UTILITY POLE
2. EQUIPMENT VAULT AT BASE OF EXISTING POLE
3. EQUIPMENT PEDESTAL W/ BBU AND ELECTRICAL METER AT BASE OF POLE

SHEET INDEX:

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON10
VERIZON MONTECITO-MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
R.O.W. NORTH SIDE OF EAST VALLEY RD
(ADJACENT TO 2110 EAST VALLEY RD)
SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: -119.60648

SHEET TITLE:

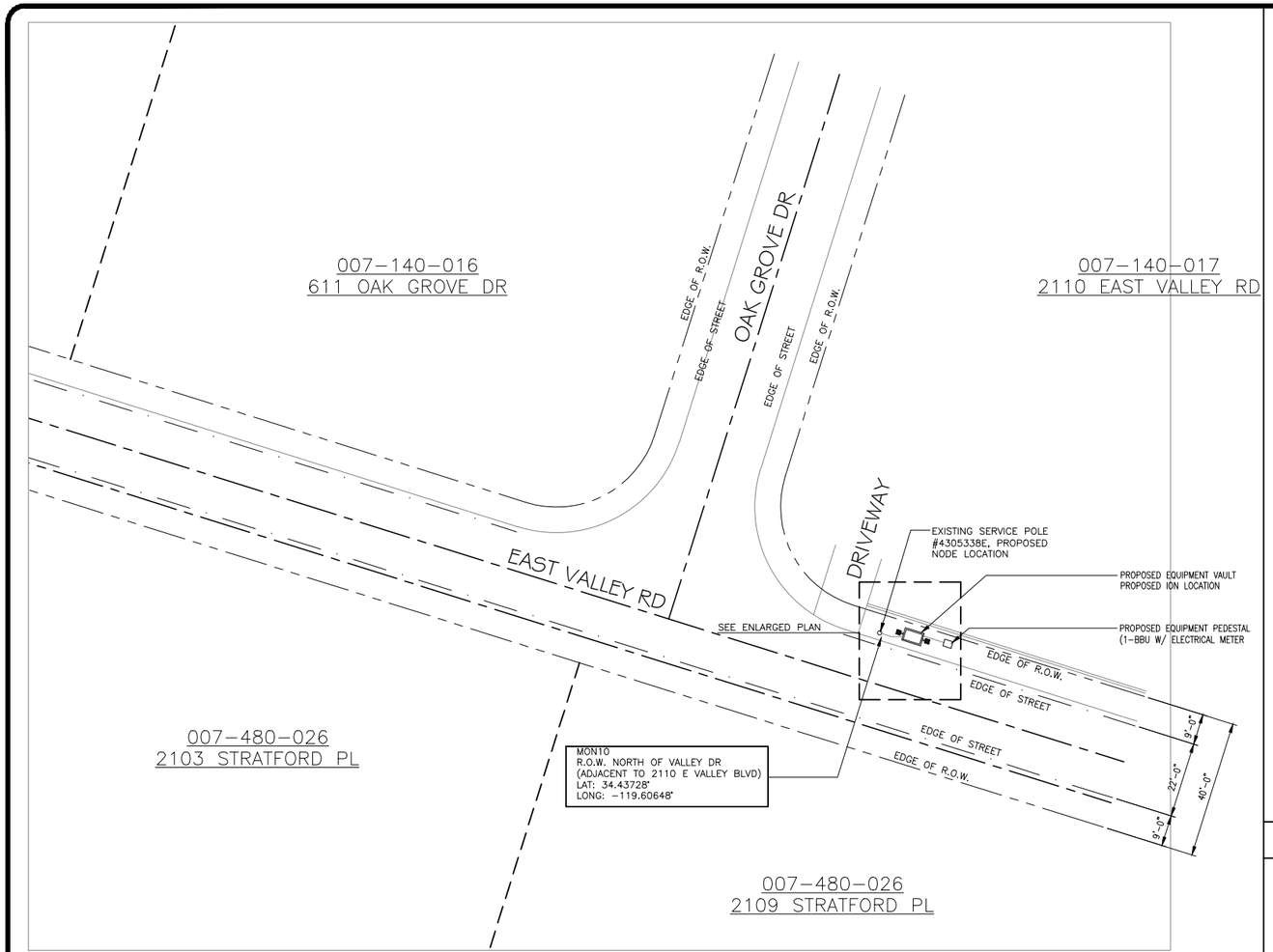
TITLE SHEET

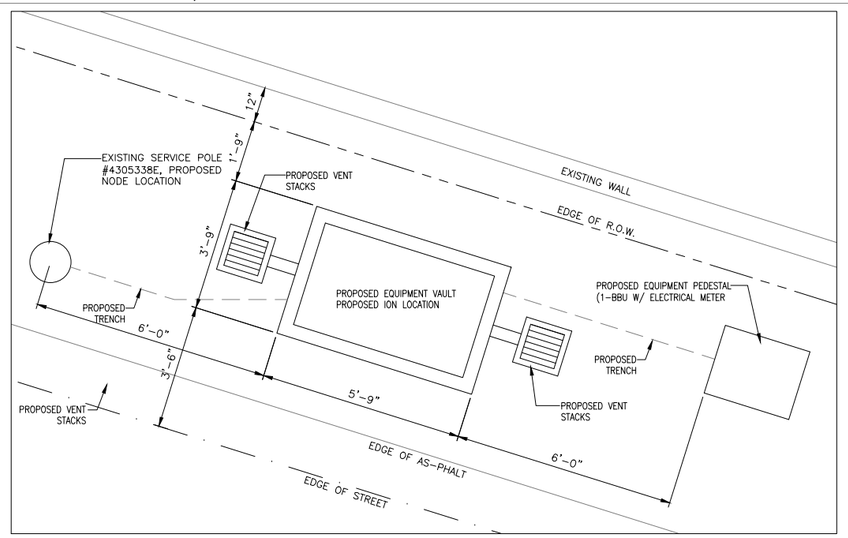
DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

T-1





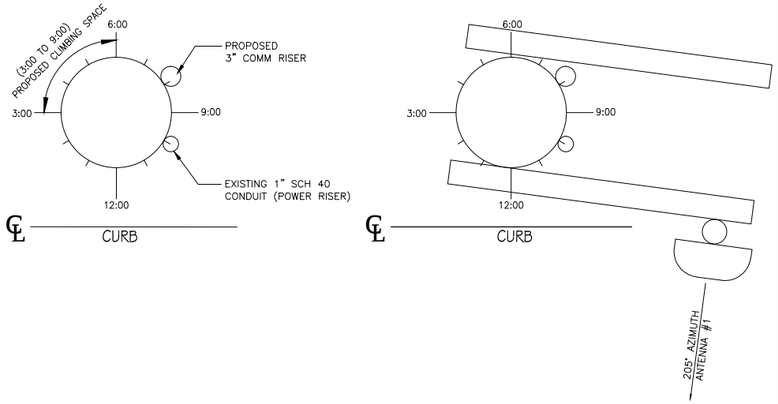
ENLARGED PLAN

SITE PLAN — SCALE: 1"=20'-0" (0, 10', 20') — 1

EXISTING PHOTO — SCALE: N.T.S. — 3

POLE WILL BE STEPPED IN
ACCORDANCE TO G095 STANDARDS
IN RESPECT TO CLIMBING SPACE.

1-3" CROWN CASTLE RISER @ 8:00
1-1" POWER RISER @ 10:00



RISER PROFILE — SCALE: N.T.S. — 2

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CDG

CONNELL DESIGN GROUP, LLC

CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON10
VERIZON MONTECITO-MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
R.O.W. NORTH SIDE OF EAST VALLEY RD
(ADJACENT TO 2110 EAST VALLEY RD)
SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: -119.60648

SHEET TITLE:

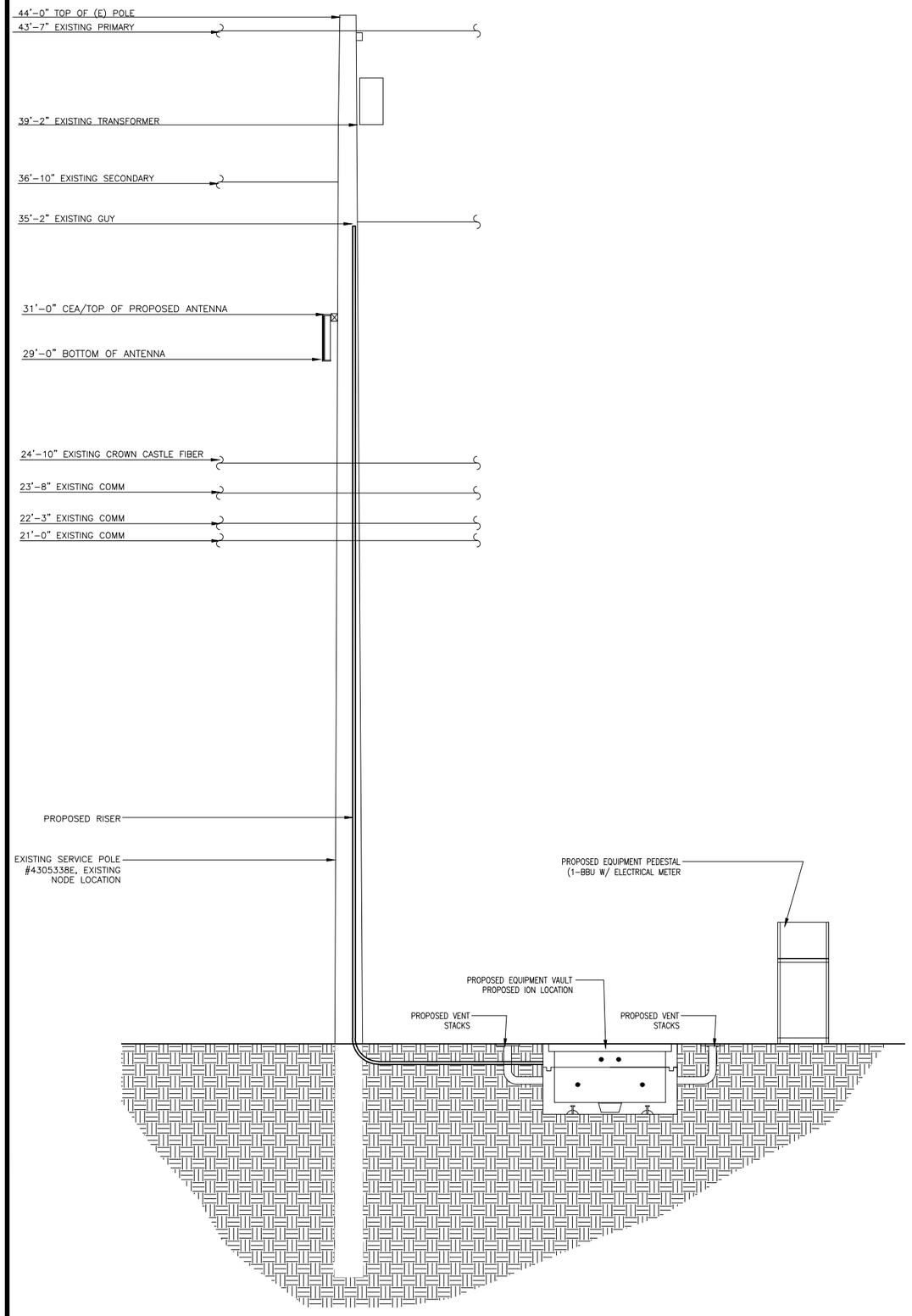
SITE PLAN AND ELEVATION

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

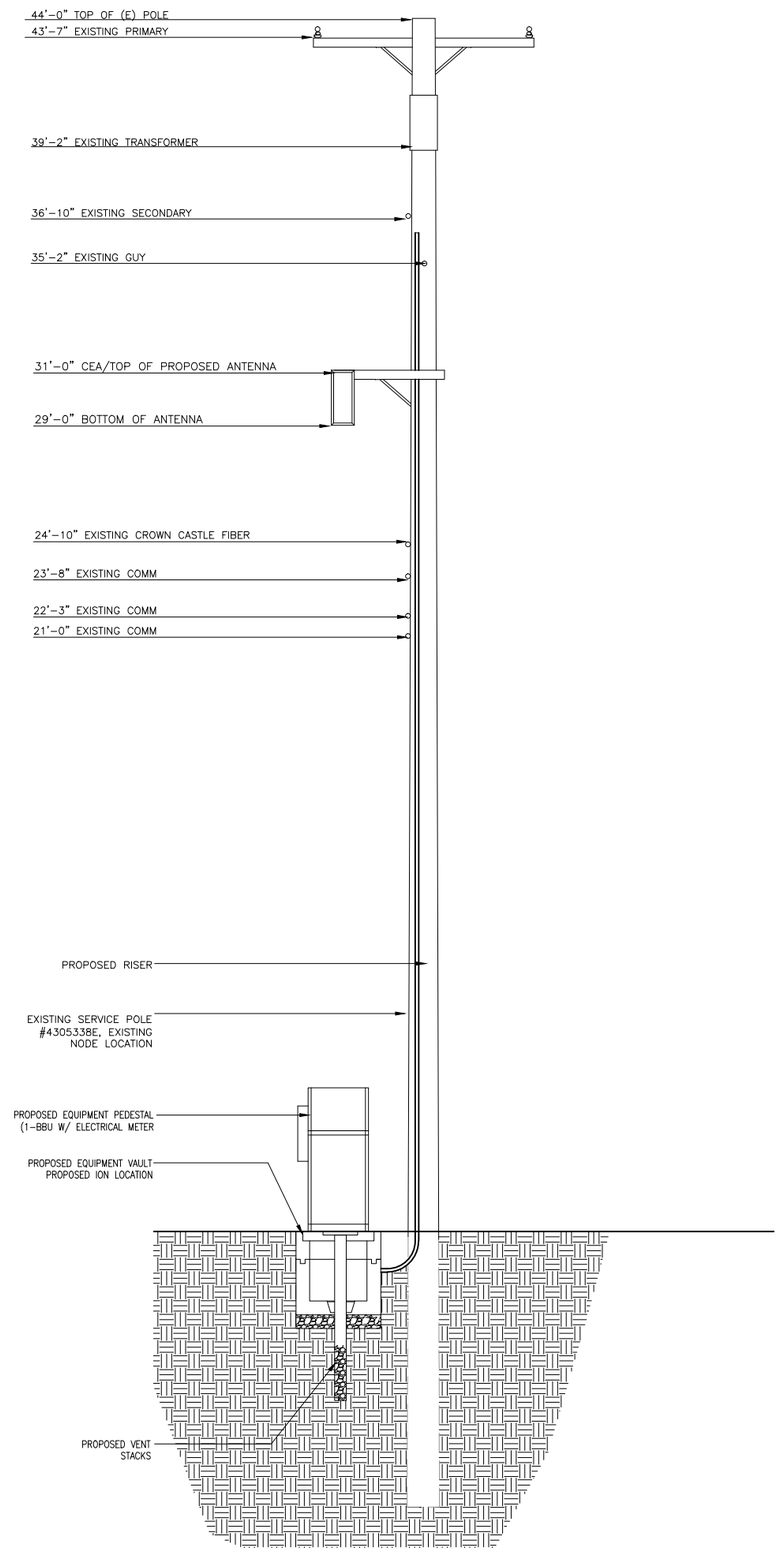
A-1



PROPOSED ELEVATION LOOKING NORTH

SCALE: 3/8"=1'-0" (0 1' 2' 3')

1



PROPOSED ELEVATION LOOKING WEST

SCALE: 3/8"=1'-0" (0 1' 2' 3')

2

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:

MON10

VERIZON MONTECITO-MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
R.O.W. NORTH SIDE OF EAST VALLEY RD
(ADJACENT TO 2110 EAST VALLEY RD)
SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: -119.60648

SHEET TITLE:

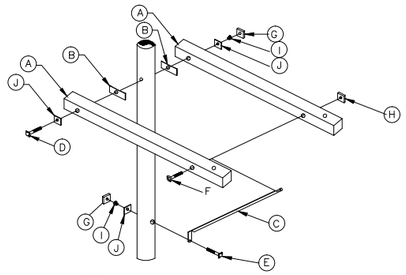
ELEVATION

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

A-2

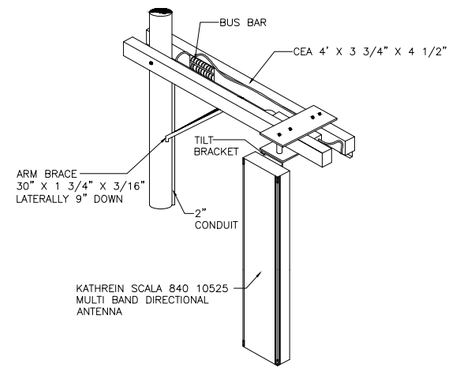


NOTES:
1. CROSS ARM AND BRACE MAY VARY IN LENGTH AND DIMENSION.
2. 5/8" MACHINE BOLTS WILL VARY DUE TO POLE DIAMETER.
3. ALL LINE HARDWARE TO BE HOT DIPPED GALVANIZED IRON.
4. BRACE MAY BE REVERSED DUE TO POLE CONDITIONS.

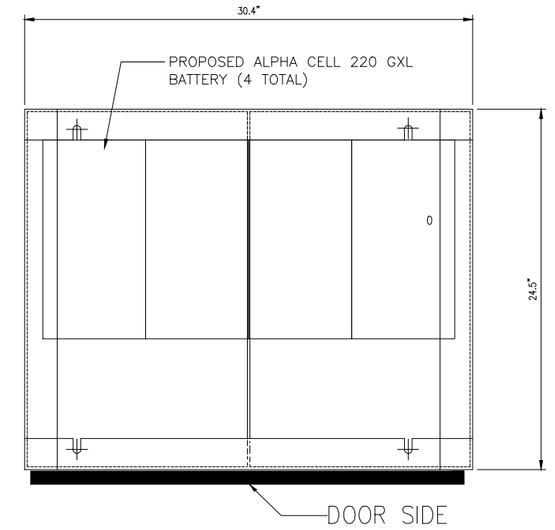
PARTS LIST

CALLOUTS	QTY	DESCRIPTION
A	2	WOOD CROSS ARM 4' X 3 3/4" X 4 1/2"
B	2	GAIN PLATE 4 1/2" X 4 1/2"
C	1	EXTENSION ARM BRACE 47" X 1 3/4" X 3/16"
D	1	MACHINE BOLT 16" X 5/8"
E	1	MACHINE BOLT 14" X 5/8"
F	1	CARRIAGE BOLT 6" X 1/2"
G	2	SQUARE NUT 5/8"
H	1	SQUARE NUT 1/2"
I	2	DOUBLE COIL SPRING WASHER
J	3	FLAT SQUARE WASHER 2 1/4" X 2 1/4" X 3/16"

CROSS EXTENSION ARM N.T.S. 1



ANTENNA CONFIGURATION N.T.S. 3



Electrical

Power Supply
Mains power, Vac . . . . . 115 or 230

Power consumption, Watts . . . . . 1100 max.
< 750 @ normal operation

700 MHz SISO/MIMO

Frequency range, MHz
Uplink . . . . . 698 to 716/776 to 787
Downlink . . . . . 728 to 757

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
LTE	43	40**	37	34

850 MHz

Frequency range, MHz
Uplink . . . . . 824 to 849
Downlink . . . . . 869 to 894

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
Analog	43	40	37	34
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

20W for Cell, PCS bands and 700MHz MIMO

1900 MHz

Frequency range, MHz
Uplink . . . . . 1850 to 1915
Downlink . . . . . 1930 to 1995

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

CommScope®

ION-M7P/7P/85P/19P

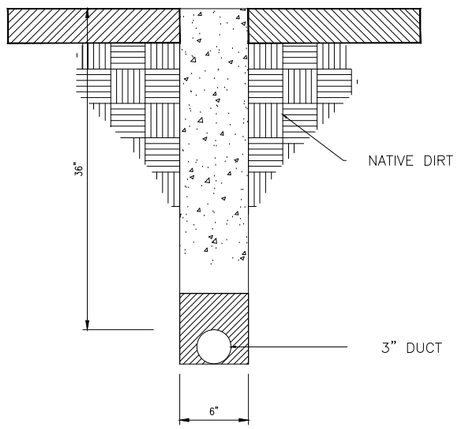
Noise figure, dB
ICP3 optimized . . . . . +10 max.
Noise figure optimized . . . . +6 max.
4.5 typical

Mechanical****

Height, width, depth, mm (in) . . . . . 817 x 245 x 218 (32.2 x 9.6 x 8.6)

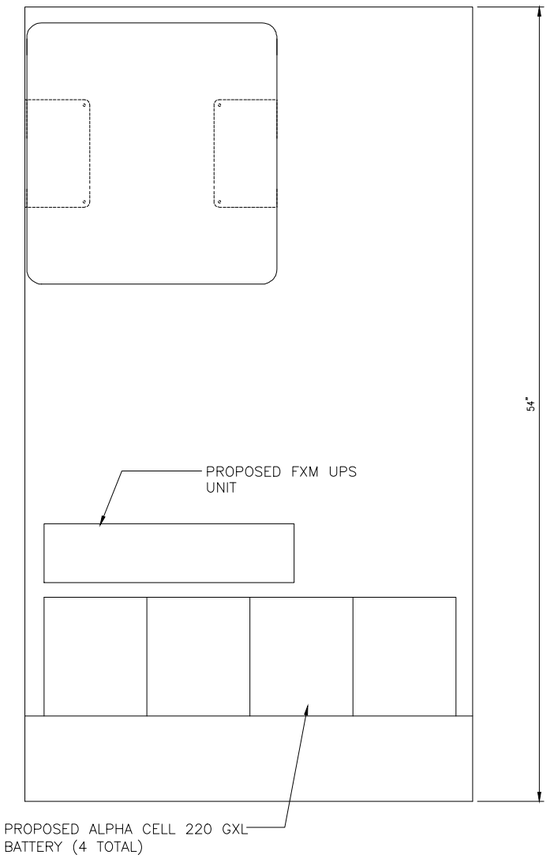
Weight, kg (lb) 40 (88.2)

ION-M7P/7P/85P/19P N.T.S. 2



* TRENCH TO BE BACK FILL WITH NATIVE MATERIAL & COMPACTED TO 90% OR BETTER & REPLACE LANDSCAPING IN KIND.

TRENCH N.T.S. 4



EQUIPMENT PEDESTAL N.T.S. 5

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON10
VERIZON MONTECITO–MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
R.O.W. NORTH SIDE OF EAST VALLEY RD
(ADJACENT TO 2110 EAST VALLEY RD)
SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: –119.60648

SHEET TITLE:

DETAILS

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

D–1

KATHREIN
SCALA DIVISION

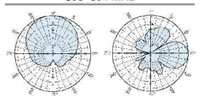
840 10525

65° Dualband Directional Antenna

Kathrein's multi-band antennas are ready for 4G applications, covering all existing wireless bands for AMPS, PCS and 3G/UMTS as well as all spectrum under consideration for future systems. These cross-polarized antennas offer diversity operation in the same space as a conventional 800 MHz antenna, and are mountable on our compact sector brackets.

- Wide band operation.
- Exceptional intermodulation characteristics.
- High strength pultruded fiberglass radome.

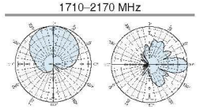
698–894 MHz



Horizontal pattern ±45°-polarization (typical pattern)

Vertical pattern ±45°-polarization (typical pattern)

1710–2170 MHz



Horizontal pattern ±45°-polarization (typical pattern)

Vertical pattern ±45°-polarization (typical pattern)

General specifications:

Frequency range	698–894 MHz 1710–2170 MHz
Impedance	50 ohms
VSWR	<1.5:1
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Connector	4 x 7-16 DIN female
Isolation intrasystem	>30 dB
Weight	15.9 lb (7.2 kg) 20.3 lb (9.2 kg) clamps included
Dimensions	23.3 x 10.6 x 6.2 inches (593 x 270 x 157 mm)
Wind load Front/Side/Rear	at 93 mph (150kph) 37 lbf / 21 lbf / 56 lbf (163 N) / (92 N) / (245 N))
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	29 x 11.9 x 7.6 inches (736 x 302 x 192 mm)
Shipping weight	23.6 lb (10.7 kg)
Mounting	Fixed mounts for 2 to 4.6 inch (50 to 115 mm) OD masts are included. Tilt mount options are available.

See reverse for order information.

Specifications:	**698–806 MHz**	**806–894 MHz**	**1710–1755 MHz**	**1850–1990 MHz**	**2110–2170 MHz**
Gain	10.5 dBi	11 dBi	13.3 dBi	13.5 dBi	12.8 dBi
Front-to-back ratio	>25 dB (co-polar)	>25 dB (co-polar)	>30 dB (co-polar)	>30 dB (co-polar)	>30 dB (co-polar)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	71° (half-power)	68° (half-power)	61° (half-power)	63° (half-power)	70° (half-power)
+45° and -45° polarization vertical beamwidth	37° (half-power)	31° (half-power)	19° (half-power)	18° (half-power)	18.5° (half-power)
Cross polar ratio (typical) Main direction 0° Sector ±60°	30 dB >8 dB	30 dB >8 dB	25 dB >8 dB	25 dB >8 dB	23 dB >8 dB

11241-D

RoHS Lead-Free

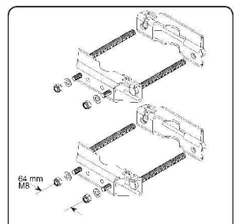
*Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

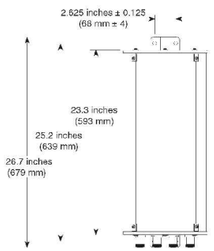
KATHREIN
SCALA DIVISION

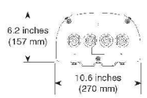
840 10525

65° Dualband Directional Antenna



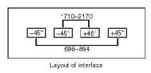
2 x 738 546 Mounting Kit (included)





Mounting Options:

Model	Description
2 x 738 546 (included)	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
850 10013	Tilt Kit for use with the 2 x 738 546 mounting kit 0–34 degrees downtilt angle.



Layout of interface

Profile PA3

Order Information:

Model	Description
840 10525	Antenna with 7-16 DIN connectors

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

ANTENNA SPECIFICATIONS | N.T.S. | 1

AlphaCell
General Specifications

Model:	220 GXL	195 GXL	165 GXL
Warranty[1]:	4 to 5 year full replacement	4 to 5 year full replacement	4 to 5 year full replacement
Service Life:	Extended	Extended	Extended
Runtime (minutes)[2]:	220	195	165
Sealed VRLA:	Valve regulated lead acid	Valve regulated lead acid	Valve regulated lead acid
Heat Resistant:	Extreme	Extreme	Extreme
Hydrogen Emission:	Low	Low	Low
Terminals:	Threaded insert 1/4"- 20 UNC	Threaded insert 1/4" - 20 UNC	Threaded insert 1/4"- 20 UNC

Specifications[4]

Model:	220 GXL	195 GXL	165 GXL
Typical Runtime (minutes)[2]:	220	195	165
Cells Per Unit:	6	6	6
Voltage Per Unit:	12.8	12.8	12.8
Conductance Value:	1175	1100	1000
Max. Discharge Current (A):	900	900	800
Short Circuit Current (A):	2800	2600	2500
10 Second Volts @ 100A:	11.4	11.3	11.2
Ohms Impedance 60Hz:	0.0050	0.0050	0.0055
Nominal Capacity at 20hrs: (to 1.75VPC)	109Ah	100Ah	86
Nominal Capacity at 20hrs: (to 1.70VPC)	110Ah	102Ah	87
BCI Group Size:	31	31	27
Weight (lb/kg):	73/33.2	67/30.5	63/28.6
Height w/ Terminals (in/mm):	8.48/215.4	8.48/215.4	8.05/204.5
Width (in/mm)[3]:	13.42/340.9	13.42/340.9	12.5/317.8
Depth (in/mm)[3]:	6.80/172.7	6.80/172.7	6.83/173.4
Operating Temperature Range Discharge:	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)
Charge (with temp compensation):	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)
Float Charging Voltage (Vdc):	13.5 to 13.8	13.5 to 13.8	13.5 to 13.8
AC Ripple Charger:	0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P		

Notes:
[1] Warranty varies by country and reg on. Warranty valid only when used with Alpha aprovad Power Supplies, Chargers and Enclosures. Consult your sales person for details.
[2] Runtimes calculated using a 25A DC constant current load.
[3] Dimensions at top of battery.
[4] See AlphaCell Users Guide for Additional Details.

Typical Standby Time in Minutes @ 25°C/77°F

XM230Vac[2]	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	508	453	396	320	285	249	236	209	193	198	165	144
4 batteries:	707	625	546	444	396	346	329	293	256	261	232	203
5 batteries:	1001	978	853	701	625	546	523	465	407	418	372	325
8 batteries:	1497	1338	1165	960	859	750	720	643	562	577	515	450
9 batteries:	1888	1519	1322	1091	978	853	820	733	640	659	587	514
XM290Vac[2]	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	149	132	115	119	106	92	101	89	77	87	78	66
4 batteries:	210	187	163	169	151	132	144	128	112	124	111	96
6 batteries:	339	301	264	275	245	214	236	209	183	204	182	159
8 batteries:	478	419	367	385	341	299	329	293	256	288	255	223
9 batteries:	538	479	419	440	391	342	377	335	294	329	293	256
XM280Vac[2]	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	798	712	622	508	453	396	377	335	294	300	267	233
4 batteries:	1001	978	853	701	625	546	523	465	407	418	372	325
6 batteries:	1888	1519	1322	1091	978	853	820	733	640	659	587	514
8 batteries:	2286	2057	1798	1487	1338	1165	1122	1006	877	904	809	706
9 batteries:	2590	2345	2037	1686	1519	1322	1273	1143	997	1027	921	803
XM260Vac[2]	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	242	215	188	198	174	151	166	148	125	144	128	107
4 batteries:	339	301	264	275	245	214	236	209	182	204	182	155
6 batteries:	538	479	419	440	391	340	377	335	290	329	293	252
8 batteries:	741	660	577	607	541	470	523	465	402	458	407	351
9 batteries:	843	753	658	692	617	538	597	531	462	523	465	402

*Above calculations based on an AC load with a .90 cable plant power factor.

For contact information visit www.alpha.com

The Alpha Group >

North America	Europe, Middle East & Africa			Asia Pacific	Latin & South America
Canada Tel: +1 604 436 1476 Fax: +1 604 430 8908 Toll Free: +1 800 667 0740	Cyprus Tel: +357 25 375 675 Fax: +357 52 359 595	Germany Tel: +49 9122 79889 0 Fax: +49 9122 79389 21	Lithuania Tel: +370 5 210 5291 Fax: +370 5 210 5292	P.R. China Tel: +852 2736 8663 Fax: +852 2199 7988	Contact USA office
USA Tel: +1 360 647 2360 Fax: +1 360 671 4936	Russia Tel: +7 495 935 9844 Fax: +7 495 916 1249	United Kingdom Tel: +44 1279 501110 Fax: +44 1279 653070			

049-257-10-B002 (06/09)

BATTERY SPECIFICATIONS | N.T.S. | 2

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON10
VERIZON MONTECITO–MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
R.O.W. NORTH SIDE OF EAST VALLEY RD
(ADJACENT TO 2110 EAST VALLEY RD)
SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: –119.60648

SHEET TITLE:

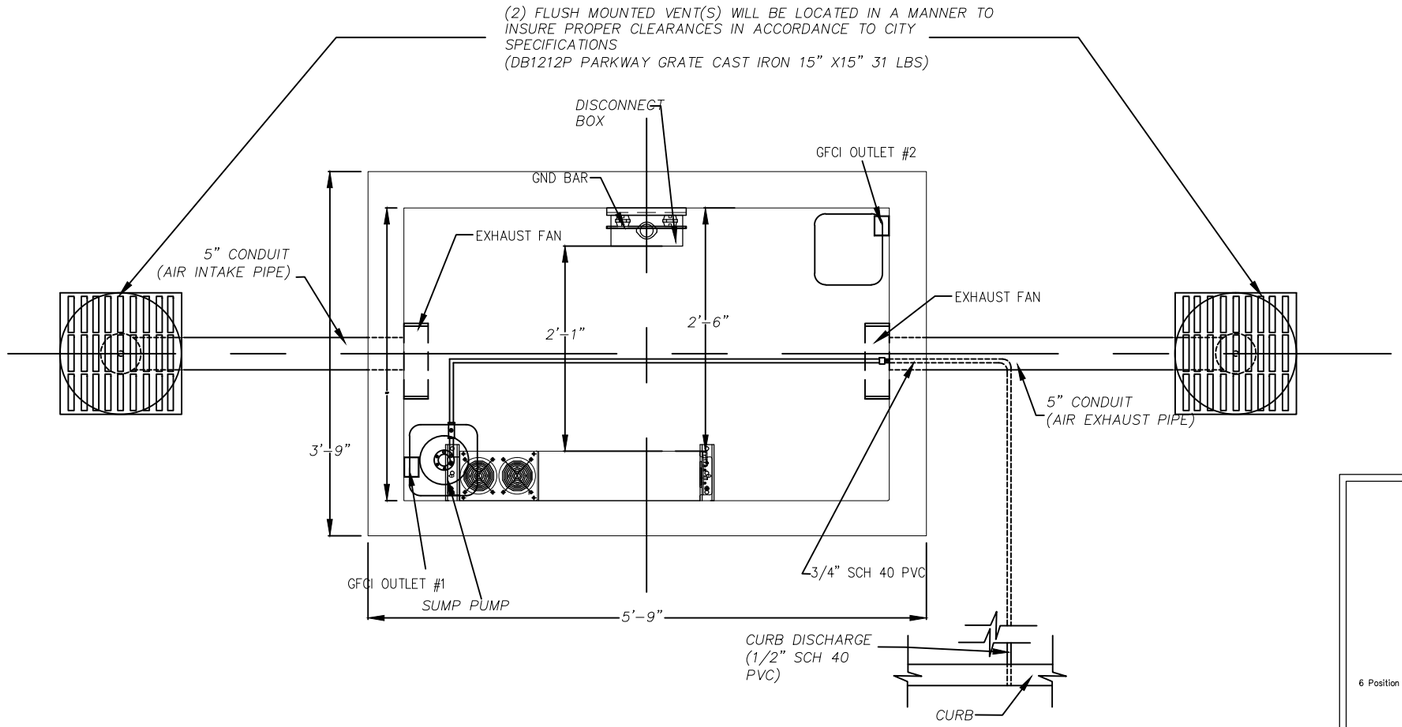
DETAILS

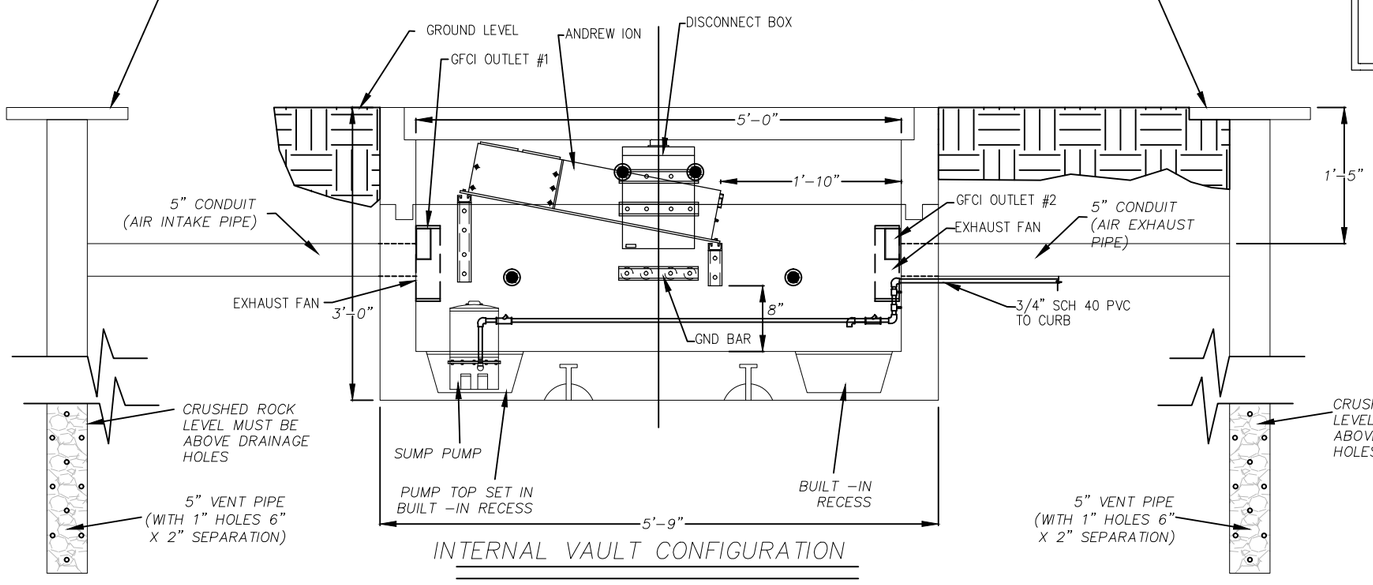
DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

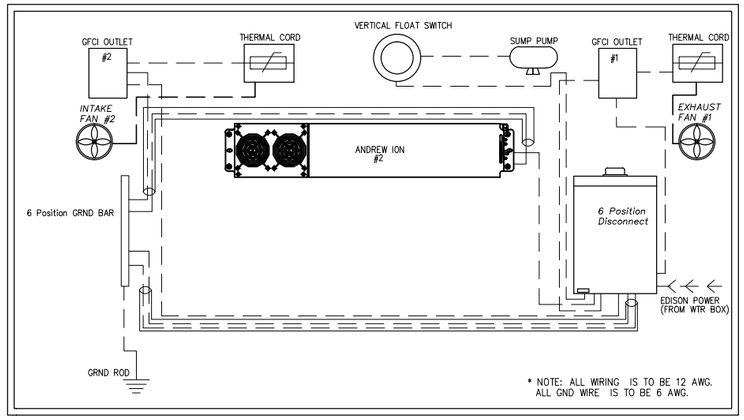
D–2





INTERNAL VAULT CONFIGURATION

WIRING SCHEMATIC



— — — GROUND WIRE (6 AWG)
— — — POWER WIRE (12 AWG)
1/2" LIQUIDTIGHT FLEX

* VENTS CAN BE FIELD CONFIGURED TO REDUCE OVER ALL FOOT PRINT AND AID REDUCING THE IMPACT ON THE SURROUNDING ENVIRONMENT.

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/15/2013	ISSUED FOR REVIEW

ENGINEER/CONSULTANT:

Civil Engineer

CDG

CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

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SITE INFO:

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VERIZON MONTECITO-MON10

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C1
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SANTA BARBARA, CA 93108
LAT: 34.43728
LONG: -119.60648

SHEET TITLE:

DETAILS

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

D-3

Attachment 2

Antenna Specifications

KATHREIN
SCALA DIVISION

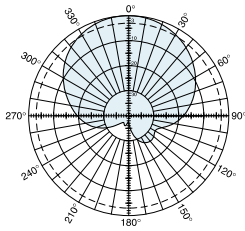
Preliminary **840 10525**

65° Dualband Directional Antenna

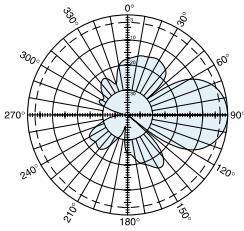
Kathrein's dual band antennas are ready for 3G applications, covering all existing wireless bands as well as all spectrum under consideration for future systems, LTE, PCS and 3G/UMTS. These cross-polarized antennas offer diversity operation in the same space as a conventional 700 MHz antenna, and are mountable on our compact sector brackets

- Wide band operation.
- Exceptional intermodulation characteristics.
- Various gain, beamwidth and downtilt ranges.
- High strength pultruded fiberglass radome.

698–894 MHz

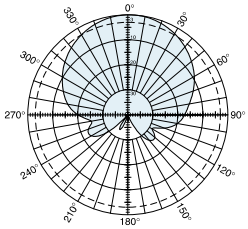


Horizontal pattern
±45°-polarization
(typical pattern)

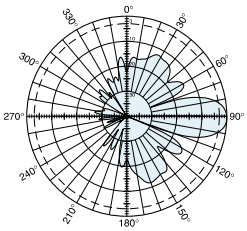


Vertical pattern
±45°-polarization
(typical pattern)

1710–2170 MHz



Horizontal pattern
±45°-polarization
(typical pattern)



Vertical pattern
±45°-polarization
(typical pattern)

General specifications:

Frequency range	698–894 MHz 1710–2170 MHz
Impedance	50 ohms
VSWR	<1.5:1
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Connector	4 x 7-16 DIN female
Isolation intrasystem	>30 dB
Weight	15.9 lb (7.2 kg)
Dimensions	22.8 x 10.3 x 5.5 inches (579 x 262 x 139 mm)
Wind load Front/Side/Rear	at 93 mph (150kph) 23 lbf / 18 lbf / 41 lbf (100 N) / (80 N) / (180 N)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	29 x 11.9 x 7.6 inches (736 x 302 x 192 mm)
Shipping weight	19.2 lb (8.7 kg)
Mounting	Fixed and tilt mount options are available for 2 to 4.6 inch (50 to 115 mm) OD masts.
See reverse for order information.	

Specifications:	**698–806 MHz**	**824–894 MHz**	**1710–1755 MHz**	**1850–1990 MHz**	**2110–2170 MHz**
Gain	10.5 dBi	11 dBi	12.5 dBi	13.3 dBi	13.6 dBi
Front-to-back ratio	>25 dB (co-polar)	>25 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	72° (half-power)	66° (half-power)	64° (half-power)	64° (half-power)	60° (half-power)
+45° and -45° polarization vertical beamwidth	37° (half-power)	34° (half-power)	19° (half-power)	18.5° (half-power)	18° (half-power)
Cross polar ratio Main direction 0° Sector ±60°	 30 dB (typical) >10 dB	 25 dB (typical) >10 dB	 25 dB (typical) >8 dB	 25 dB (typical) >8 dB	 25 dB (typical) >8 dB

* Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

RoHS Lead-Free

11241-FRO/a

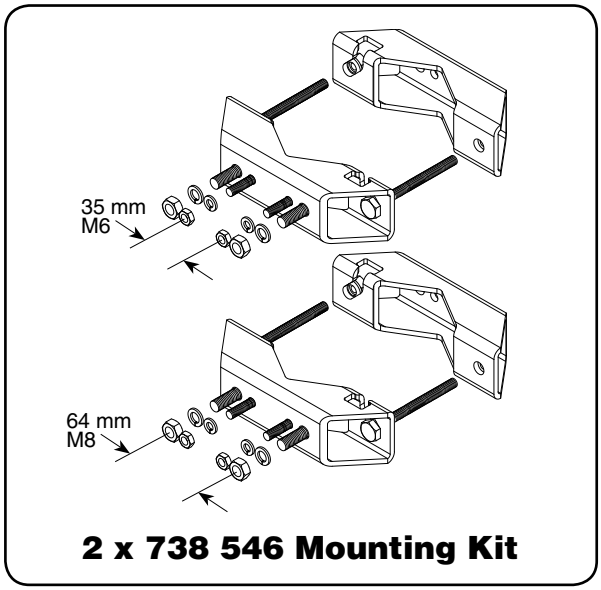
Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

KATHREIN
SCALA DIVISION

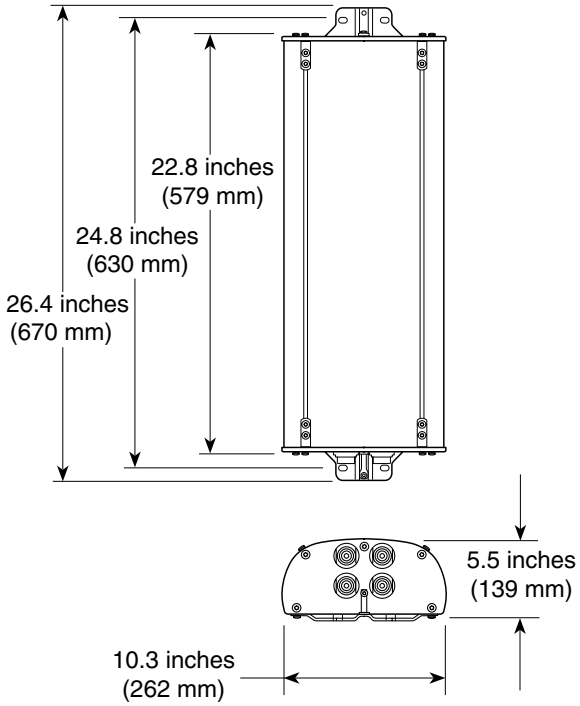
Preliminary

840 10525

65° Dualband Directional Antenna



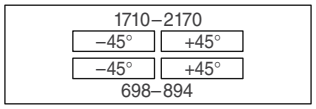
2 x 738 546 Mounting Kit



Profile PA2

Mounting Options:

Model	Description
2 x 738 546	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
850 10013	Tilt Kit for use with the 2 x 738 546 mounting kit 0–34 degrees downtilt angle.



Order Information:

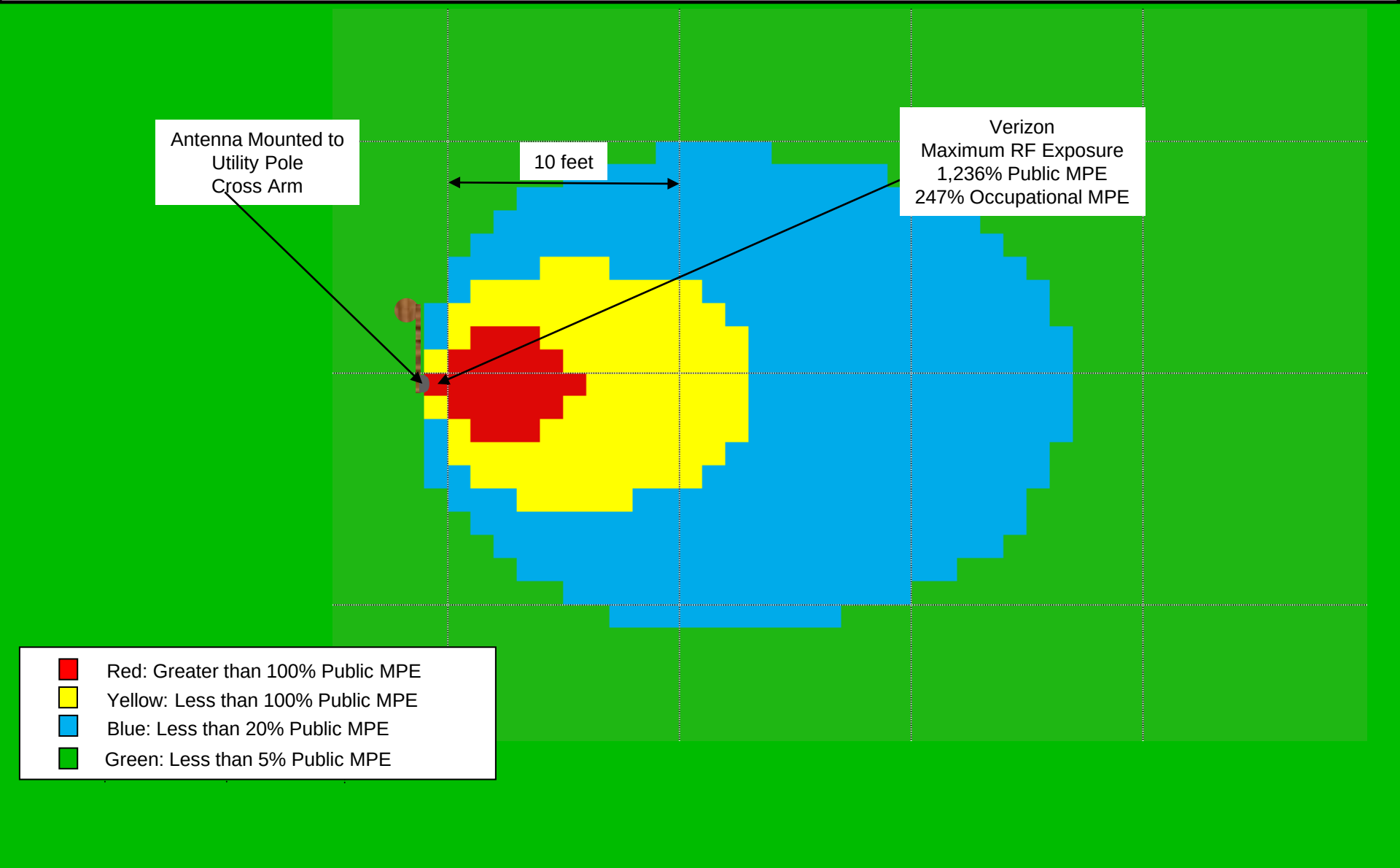
Model	Description
840 10525	Antenna with 7-16 DIN connectors

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

Appendix A-1

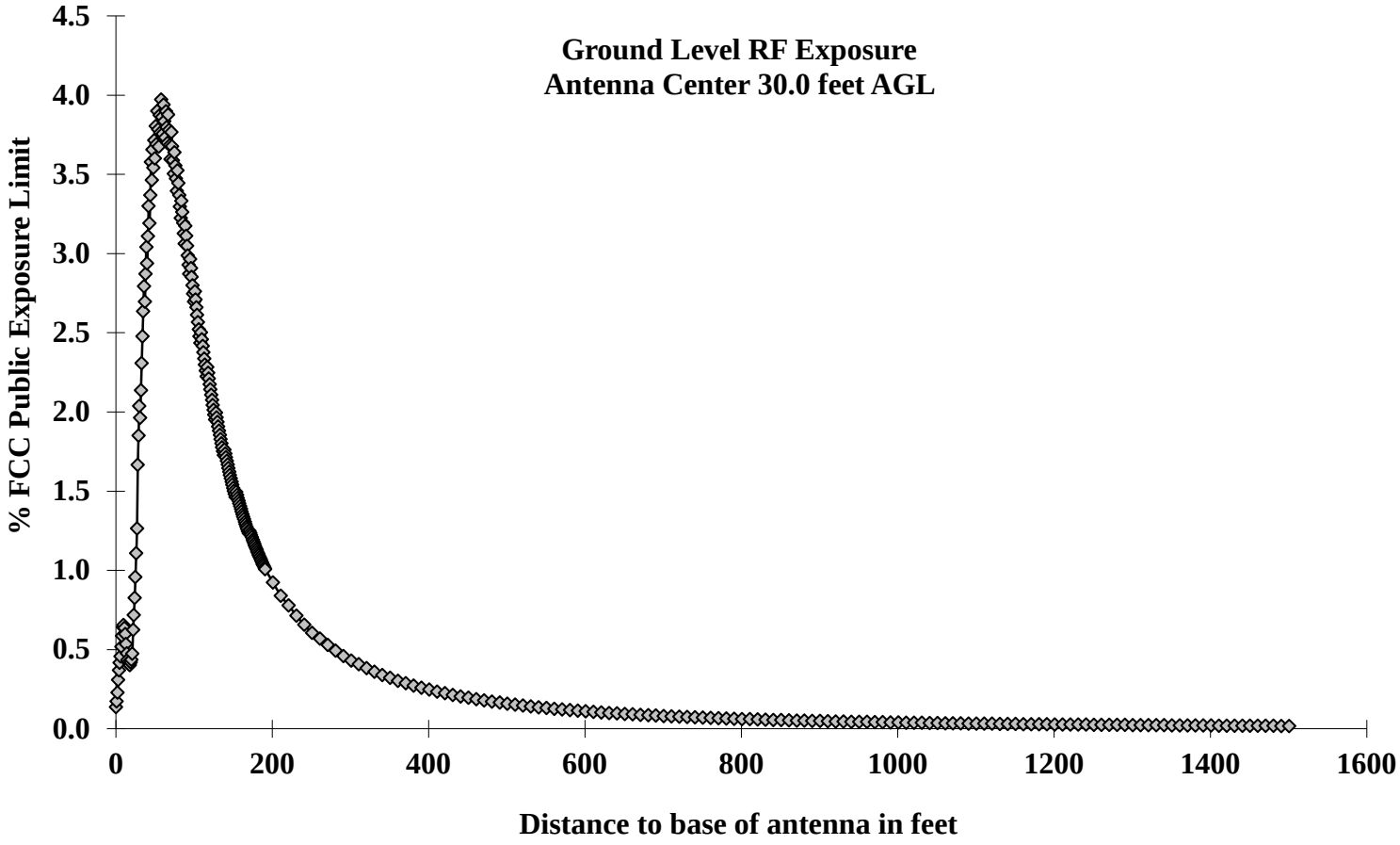
RF EXPOSURE AT ANTENNA LEVEL

RF EXPOSURE AT THE LEVEL OF THE ANTENNA
BASED ON PERCENTAGE OF FCC MAXIMUM
PUBLIC & OCCUPATIONAL EXPOSURE LIMIT



Appendix A-2

RF EXPOSURE AT GROUND LEVEL


Ground Level RF Exposure
Antenna Center 30.0 feet AGL
% FCC Public Exposure Limit
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
1600
Distance to base of antenna in feet

Appendix A-3

RF CAUTION SIGN

CAUTION

The radio frequency (RF) emissions at this site have been evaluated for potential RF exposure to personnel who may need to work near these antennae.

RF EXPOSURE AT 6 FEET OR CLOSER TO THE FACE OF THE ANTENNA *MAY EXCEED THE FCC PUBLIC EXPOSURE LIMITS.* RF EXPOSURE AT 3 FEET OR CLOSER TO THE FACE OF THE ANTENNA *MAY EXCEED THE FCC OCCUPATIONAL EXPOSURE LIMITS. OBEY ALL* SITE RF SAFETY GUIDELINES. ONLY QUALIFIED WORKERS THAT HAVE RF SAFETY TRAINING MAY WORK WITHIN THE PUBLIC EXCLUSION ZONE. ANYONE NEEDING TO WORK INSIDE THE EXCLUSION ZONE SHOULD CALL:1-866-639-8460 FOR INSTRUCTIONS PRIOR TO COMMENCING WORK. REFER TO SITE: _____

Reference: Federal Communications Commission (FCC) Public Exposure Standard. OET Bulletin-65, Edition 97-01, August 1997.

STATEMENT OF EXPERIENCE

Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM, FAAPM
(800) 760-8414 jbushberg@hampc.com

Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. In addition, Dr. Bushberg has extensive experience and lectures on several related topics including medical physics, radiation protection, (ionizing and non-ionizing), radiation biology, the science of risk assessment and effective risk communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University was on various aspects of the biological effects of microwave radiation. He has maintained a strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, the California Council on Science and Technology, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections. Dr. Bushberg has performed RF & ELF environmental field measurements and recommend appropriate mitigation measures for numerous transmission facilities in order to assure compliance with FCC and other safety regulations and standards. The consultation services provided by Dr. Bushberg are based on his professional judgement as an independent scientist, however they are not intended to necessarily represent the views of any other organization.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of nonionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of nonionizing electromagnetic radiation. Dr.Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurements (NCRP). He is also the Senior Scientific Vice-President of the NCRP and chairman of the NCRP Board of Directors. Dr. Bushberg has served as chair of the NCRP committee on Radiation Protection in Medicine and he continues to serve as a member of this committee as well as the NCRP scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based, in large part, on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of responsibility the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg also served for several years as a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the FCC and the FDA Center for Devices and Radiological Health.

Dr. Bushberg is a full member of the Bioelectromagnetics Society, the Health Physics Society and the Radiation Research Society. Dr. Bushberg received both a Masters of Science and Ph.D. from the Department of Bionucleonics at Purdue University. Dr. Bushberg is a fellow of the American Association of Physicists in Medicine and is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to California, Dr. Bushberg was on the faculty of Yale University School of Medicine.

JERROLD T. BUSHBERG Ph.D., DABMP, DABSNM, FAAPM
♦HEALTH AND MEDICAL PHYSICS CONSULTING♦

7784 Oak Bay Circle Sacramento, CA 95831
(800) 760-8414–jbushberg@hampc.com

Bhavani Yella
Crown Castle
890 Tasman Drive
Milpitas, CA 95035

April 24, 2013

Introduction

At your request, I have reviewed the technical specifications and calculated the maximum potential radiofrequency, (RF), power density from the proposed Crown Castle (CC) Dual Panel Distributed Antenna System (DAS) sites proposed for the right-of-way in Santa Barbara, CA. A DAS is a network of spatially separated antenna sites called "nodes" connected to a common source that provides wireless service within a geographic area. DAS antennae are typically installed near the top of light standards or on utility poles. The idea is to split the transmitted signal among several antenna sites, separated in space so as to provide coverage over the same area as a single antenna but with reduced total power and improved reliability. Thus a single antenna radiating at high power is replaced by a group (i.e., network) of low-power antennas to cover the same area. Some of the other advantages of DAS include the ability to provide service for multiple wireless carriers without the need to have separate antenna sites for each carrier at each location and the ability to place the antennae on existing vertical structures such as light or utility poles.

This proposed DAS node will utilize three omni antennae mounted on the cross arms of a utility pole. Two of the antennae will be Comba model OOA-360V06N0-3. The maximum effective radiated power (ERP) from one of the Comba omni antennae will be up to 35.24 watts at approximately 775 MHz utilizing LTE transmission technology; 21.63 watts at approximately 850 MHz and 44.16 watts at approximately 1,900 MHz utilizing CDMA/EVDO transmission technology. The maximum ERP of the other Comba omni antennae will be up to 35.24 watts at approximately 775 MHz utilizing LTE transmission technology. The maximum ERP of the third omni antenna (Amphenol antenna model WB3X080X06Fx50) will be 138.16 watts at approximately 2,100 MHz utilizing LTE transmission technology and 69.18 watts at approximately 1,850 MHz utilizing GSM/UMTS transmission technology. The distance from the antenna center to the ground will be at least 22.0 feet. This proposed DAS node will be located at 453 Sheffield Dr, Santa Barbara, CA, 93108 and the site plan is shown in attachment one. The antenna specification details are depicted in attachment two.

Calculation Methodology

Calculations at the level of the antenna were made in accordance with the cylindrical model recommendations for near-field analysis contained in the Federal Communications Commission, Office of Engineering and Technology Bulletin 65 (OET 65) entitled "Evaluating Compliance with FCC-Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." RF exposure calculations at ground level were made using equation 10 from the same OET document. Several assumptions were made in order to provide the most conservative or "worst case" projections of power densities. Calculations were made assuming all channels

were operating simultaneously at their maximum design effective radiated power. Attenuation (weakening) of the signal that would result from surrounding foliage or buildings was ignored. Buildings or other structures can reduce the signal strength by a factor of 10 (i.e., 10 dB) or more depending upon the construction material. In addition, for ground level calculations, the ground or other surfaces were considered to be perfect reflectors (which they are not) and the RF energy was assumed to overlap and interact constructively at all locations (which they would not) thereby resulting in the calculation of the maximum potential exposure. In fact, the accumulations of all these very conservative assumptions, will significantly overestimate the actual exposures that would typically be expected from such a facility. However, this method is a prudent approach that errs on the side of safety.

RF Safety Standards

The two most widely recognized standards for protection against RF field exposure are those published by the American National Standards Institute (ANSI) C95.1 and the National Council on Radiation Protection and measurement (NCRP) report #86. The NCRP is a private, congressionally chartered institution with the charge to provide expert analysis of a variety of issues (especially health and safety recommendations) on radiations of all forms. The scientific analyses of the NCRP are held in high esteem in the scientific and regulatory community both nationally and internationally. In fact, the vast majority of the radiological health regulations currently in existence can trace their origin, in some way, to the recommendations of the NCRP.

All RF exposure standards are frequency-specific, in recognition of the differential absorption of RF energy as a function of frequency. The most restrictive exposure levels in the standards are associated with those frequencies that are most readily absorbed in humans. Maximum absorption occurs at approximately 80 MHz in adults. The NCRP maximum allowable continuous occupational exposure at this frequency is 1,000 $\mu W/cm^2$. This compares to 2,933 $\mu W/cm^2$ at cellular frequencies and 5,000 $\mu W/cm^2$ at PCS frequencies that are absorbed much less efficiently than exposures in the VHF TV band.

The traditional NCRP philosophy of providing a higher standard of protection for members of the general population compared to occupationally exposed individuals, prompted a two-tiered safety standard by which levels of allowable exposure were substantially reduced for "uncontrolled " (e.g., public) and continuous exposures. This measure was taken to account for the fact that workers in an industrial environment are typically exposed no more than eight hours a day while members of the general population in proximity to a source of RF radiation may be exposed continuously. This additional protection factor also provides a greater margin of safety for children, the infirmed, aged, or others who might be more sensitive to RF exposure. After several years of evaluating the national and international scientific and biomedical literature, the members of the NCRP scientific committee selected 931 publications in the peer-reviewed scientific literature on which to base their recommendations. The current NCRP recommendations limit continuous public exposure at cellular frequencies (e.g., ~820MHz) to 550 $\mu W/cm^2$ and to 1,000 $\mu W/cm^2$ at PCS frequencies (~1,900 MHz).

The 1992 ANSI standard was developed by Scientific Coordinating Committee 28 (SCC 28) under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). This standard, entitled "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991), was issued in April 1992 and subsequently adopted by ANSI. A revision of this standard (C95.1-2005) was completed in October 2005 by SCC 39 the IEEE International Committee on Electromagnetic Safety. Their recommendations are similar to the NCRP recommendations for the maximum permissible exposure (MPE) to the public PCS frequencies (950 $\mu W/cm^2$ for continuous exposure at 1,900 MHz) and incorporates the convention of providing for a greater margin of safety for public as compared with

occupational exposure. Higher whole body exposures are allowed for brief periods provided that no 30 minute time-weighted average exposure exceeds these aforementioned limits.

On August 9, 1996, the Federal Communications Commission (FCC) established a RF exposure standard that is a hybrid of the current ANSI and NCRP standards. The maximum permissible exposure values used to assess environmental exposures are those of the NCRP (i.e., maximum public continuous exposure at cellular and PCS frequencies of 550 $\mu W/cm^2$ and 1,000 $\mu W/cm^2$ respectively). The FCC issued these standards in order to address its responsibilities under the National Environmental Policy Act (NEPA) to consider whether its actions will "significantly affect the quality of the human environment." In as far as there was no other standard issued by a federal agency such as the Environmental Protection Agency (EPA), the FCC utilized their rulemaking procedure to consider which standards should be adopted. The FCC received thousands of pages of comments over a three-year review period from a variety of sources including the public, academia, federal health and safety agencies (e.g., EPA & FDA) and the telecommunications industry. The FCC gave special consideration to the recommendations by the federal health agencies because of their special responsibility for protecting the public health and safety. In fact, the MPE values in the FCC standard are those recommended by EPA and FDA. The FCC standard incorporates various elements of the 1992 ANSI and NCRP standards which were chosen because they are widely accepted and technically supportable. There are a variety of other exposure guidelines and standards set by other national and international organizations and governments, most of which are similar to the current ANSI/IEEE or NCRP standard, figure one.

The FCC standards "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation" (Report and Order FCC 96-326) adopted the ANSI/IEEE definitions for controlled and uncontrolled environments. In order to use the higher exposure levels associated with a controlled environment, RF exposures must be occupationally related (e.g., wireless company RF technicians) and they must be aware of and have sufficient knowledge to control their exposure. All other environmental areas are considered uncontrolled (e.g., public) for which the stricter (i.e., lower) environmental exposure limits apply. All carriers were required to be in compliance with the new FCC RF exposure standards for new telecommunications facilities by October 15, 1997. These standards applied retroactively for existing telecommunications facilities on September 1, 2000.

The task for the physical, biological, and medical scientists that evaluate health implications of the RF data base has been to identify those RF field conditions that can produce harmful biological effects. No panel of experts can guarantee safe levels of exposure because safety is a null concept, and negatives are not susceptible to proof. What a dispassionate scientific assessment can offer is the presumption of safety when RF-field conditions do not give rise to a demonstrable harmful effect.

Summary & Conclusions

This CC utility pole DAS node shown in attachment one, operating with the characteristics as specified above and observing an seven foot (public) exclusion zone directly in front of and at the same elevation as the antenna, will be in full compliance with FCC RF public and occupational safety exposure standards. These transmitters, by design and operation, are low-power devices. Even under maximal exposure conditions in which the antenna is transmitting at its greatest design basis ERP, the maximum exposure at the elevation of the antenna will not result in RF exposures in excess of the FCC public RF safety standard at seven or more feet from the surface of the antenna, (see appendix A-1). The maximum RF exposure at ground level will not be in excess of 1.1% of, (i.e., 90 times lower than), the FCC public safety standard, (see appendix A-2).

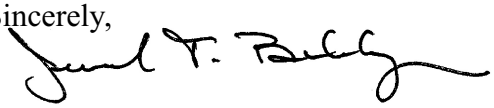
A chart of the electromagnetic spectrum and a comparison of RF power densities from various common sources is presented in figures two and three respectively in order to place exposures from DAS wireless systems in perspective. RF exposure in the neighborhood served by this and other DAS sites are very low due to three main factors. First, as previously stated, DAS is a relatively low-power technology. The maximum power into the antennae will be less than 343.8 watts. In addition, DAS sites utilize directional antennae that focus the RF energy toward the horizon, (i.e., parallel with the ground at the level of the antenna), thus only a very small percentage of the RF energy is emitted directly down toward the ground. This is similar to a lighthouse beacon that sends the majority of its light out toward the horizon with very little reaching the base of the lighthouse or people living nearby. Finally, as shown on the graph in appendix A-2, as one gets farther away from the site, the change in RF exposure intensity becomes more uniform with distance. Eventually there is a very rapid and consistent decrease in exposure with distance. Like all forms of electromagnetic energy, including light, the decrease in exposure at this point is proportional to the square of the increased distance. Thus, if the exposure at this point was 1% of the public exposure standard and one simply moved 10 times further away, (all other conditions being the same), the exposure would be 10^2 or 100 times less than before (i.e., 0.01% of the public exposure standard).

It is also important to realize that the FCC maximum allowable exposures are not set at a threshold between safety and known hazard but rather at 50 times below a level that the majority of the scientific community believes may pose a health risk to human populations. Thus, the previously mentioned maximum ground level exposure from these sites represents a "safety margin" from this threshold of potentially adverse health effects of more than 4,500 times.

Given the low levels of radiofrequency fields that would be generated from this CC antenna installations and given the evidence on RF biological effects in a large data base, there is no scientific basis to conclude that harmful effects will attend the utilization of this proposed wireless telecommunications facility. This conclusion is supported by a large number of scientists that have participated in standard-setting activities in the United States who are overwhelmingly agreed that RF radiation exposure below the FCC exposure limits has no demonstrably harmful effects on humans. An RF notice sign, containing appropriate contact information and indicating the stay back distance beyond which the RF exposures do not exceed the public maximum permissible exposure, should be placed near the antenna (see appendix A-3).

These findings are based on my professional evaluation of the scientific issues related to the health and safety of non-ionizing electromagnetic radiation and my analysis of the technical specification as provided by CC. The opinions expressed herein are based on my professional judgement and are not intended to necessarily represent the views of any other organization or institution. Please contact me if you require any additional information.

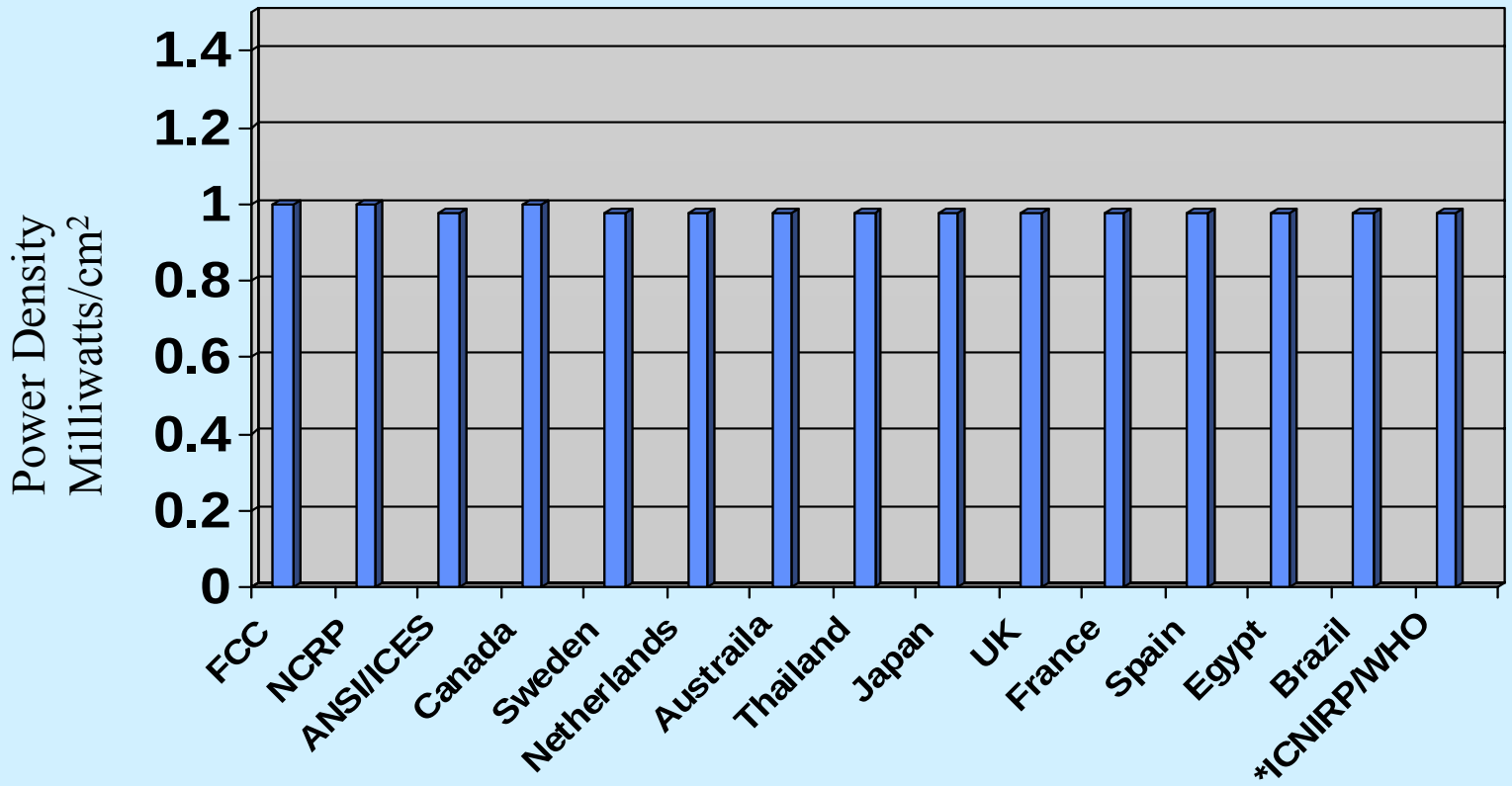
Sincerely,



Jerrold T. Bushberg Ph.D., DABMP, DABSNM
Diplomate, American Board of Medical Physics (DABMP)
Diplomate, American Board of Science in Nuclear Medicine (DABSNM)
Fellow, American Association of Physicists in Medicine (FAAPM)

Enclosures: Figures 1-3; Attachment 1,2; Appendices A1-A3 and Statement of Experience.

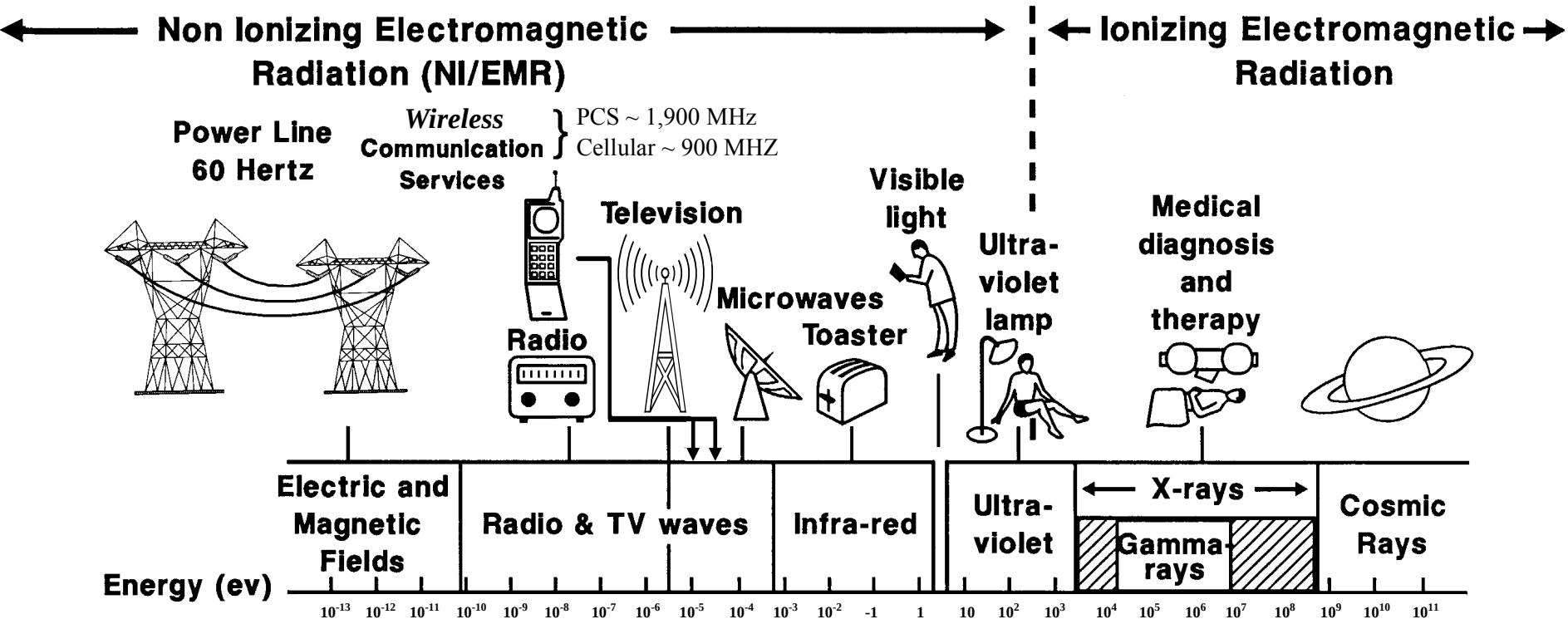
National and International Public RF Exposure Standards (DAS @ 1,950 MHz)



***International Commission on Non-Ionizing Radiation Protection (ICNIRP) Public Safety Exposure Standard. ICNIRP standard recommended by the World Health Organization (WHO). Members of the ICNIRP Scientific Committee were from:**

- **Australia**
- **Finland**
- **France**
- **Germany**
- **Hungary**
- **Italy**
- **Sweden**
- **Japan**
- **United Kingdom**
- **United States**

Figure 1



The Electromagnetic Spectrum

Figure 2

Typical Exposure from Various Radio Frequency / Microwave Sources

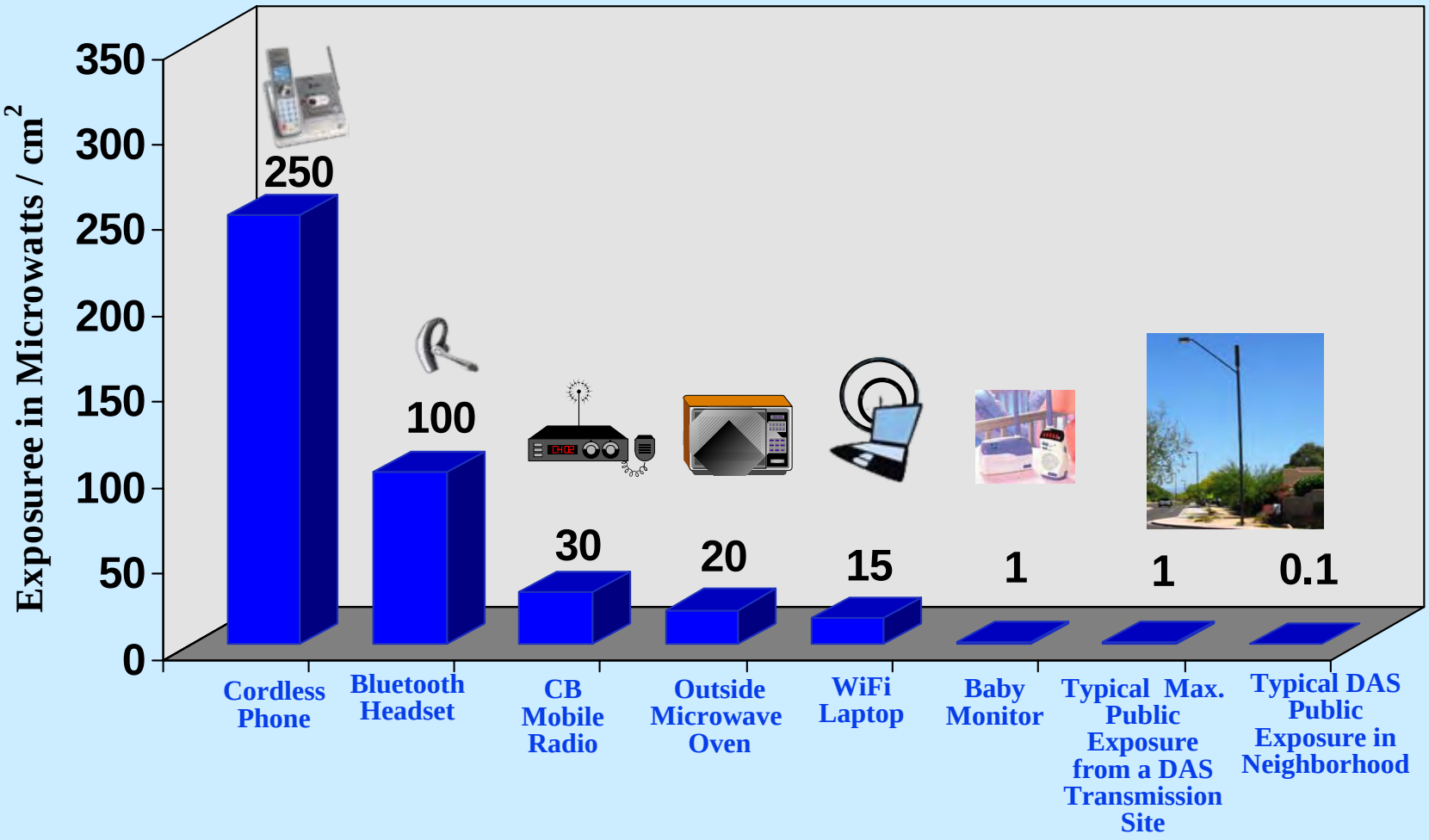


Figure 3

Attachment 1

Site Plan for DAS Node With Three Omni Antenna Mounted to Utility Pole

CROWN CASTLE NG WEST, INC

VERIZON MONTECITO-MON03m1

ROW ADJACENT WEST SIDE OF SHEFFIELD DRIVE (ADJACENT TO 2165 BIRNAM WOOD DR) SANTA BARBARA, CA 93108

GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A PERMIT HAS BEEN ISSUED.
2. UPON ISSUANCE OF A PERMIT, NO WORK WILL BE PERMITTED ON WEEKENDS OR HOLIDAYS WITHOUT PERMISSION FROM THE ENGINEERING DEPARTMENT.
3. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY THE LOCAL JURISDICTION DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR CITY LAWS, ORDINANCES, REGULATIONS, OR POLICIES, INCLUDING, BUT NOT LIMITED TO, THE FEDERAL ENDANGERED SPECIES ACT OF 1973 AND AMENDMENTS THERETO (16 USC SECTION 1531 ET.SEQ.).
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, SUCH MONUMENTS SHALL BE REPLACED WITH APPROPRIATE MONUMENTS BY A LAND SURVEYOR, A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FIELD AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE LOCAL JURISDICTION FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
5. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER BE ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TWO DAYS BEFORE YOU DIG.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
7. CONTRACTOR SHALL SUBMIT TO THE LOCAL JURISDICTION, A CONSTRUCTION PLAN TO PROTECT WATER MAINS PRIOR TO COMMENCING CONSTRUCTION.
8. CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUIT, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
9. CONTRACTOR SHALL NOTIFY THE LOCAL JURISDICTION. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING WORK WITHIN 10' OF ALL SEWER, WATER, AND STORMDRAIN MAIN INCLUDING ALL CROSSINGS.
10. THIS PROJECT WILL BE INSPECTED BY ENGINEERING AND CAPITAL PROJECTS DEPARTMENT, FIELD ENGINEERING DIVISION.
11. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY RESIDENT ENGINEER PRIOR TO THE ACCEPTANCE OF THIS PROJECT.
12. PUBLIC IMPROVEMENT SUBJECT TO DESUETUDE OR DAMAGE." IF REPAIR OR REPLACEMENT OF SUCH PUBLIC IMPROVEMENTS IS REQUIRED, THE OWNER SHALL OBTAIN THE REQUIRED PERMITS FOR WORK IN THE PUBLIC RIGHT-OFWAY, SATISFACTORY TO THE PERMIT – ISSUING AUTHORITY.
13. PRIOR TO ANY DISTURBANCE TO THE SITE, EXCLUDING UTILITY MARKS-OUTS AND SURVEYING, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRE-CONSTRUCTION MEETING WITH THE LOCAL JURISDICTION FIELD ENGINEERING DIVISION.
14. PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION SHOWN ON THESE PLANS. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE. THE CONTRACTOR IS RESPONSIBLE TO ATTEND THE LOCAL JURISDICTIONS MONTHLY UTILITY COORDINATION COMMITTEE THE CONSTRUCTION ACTIVITIES WITH THE CITY AND ALL OTHER CONTRACTORS SO THAT NO TRENCH IS CUT WITHIN ANY OF THE CITY STREETS THAT HAVE BEEN CONSTRUCTED, REPAIRED, OR SLURRY SEALED WITHIN THREE YEARS OF THE STREET CONSTRCTUION/RESURFACING DATE.
15. MANHOLES OR COVERS SHALL BE LABELED "CROWN CASTLE" OR "CROWN CASTLE NG WEST".
16. CONTRACTOR SHALL IMPLEMENT AN EROSION AND SEDIMENT CONTROL PROGRAM DURING THE PROJECT CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL MEET THE APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCE CONTROL BOARD.
17. THE CONTRACTOR SHALL HAVE EMERGENCY MATERIALS AND EQUIPMENT ON HAND FOR UNFORESEEN SITUATIONS, SUCH AS DAMAGE TO UNDERGROUND WATER, SEWER, AND STORM DRAIN FACILITIES WHEREBY FLOWS MAY GENERATE EROSION AND SEDIMENT POLLUTION.

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE CITY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF THESE NOTES AND THE CITY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1. THE CONTRACTOR SHALL VERIFY THE LOCATION EXISTING UNDERGROUND UTILITIES INCLUDING SEWER LATERALS AND WATER SERVICES TO INDIVIDUAL LOTS BOTH VERTICAL AND HORIZONTAL PRIOR TO COMMENCING IMPROVEMENT OPERATIONS.
2. CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS OF PLANS IF REVISION IS NECESSARY BECAUSE OF LOCATION OF EXISTING UTILITIES.
3. LOCATION AND ELEVATIONS OF IMPROVEMENTS, TO BE MET BY WORK, SHALL BE CONFIRMED BY FIELD MEASUREMENT PRIOR TO CONSTRUCTION OF NEW WORK.
4. GRADES SHOWN ARE FINISH GRADES, CONTRACTOR SHALL DETERMINE NECESSARY SUB GRADE ELEVATIONS AND SHALL CONSTRUCT SMOOTH TRANSITION BETWEEN FINISH GRADES SHOWN.
5. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITION DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS PROVISION SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXPECTING FOR LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
6. THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR COMPLIANCE WITH THE PROVISIONS OF THE STATE OF CALIFORNIA SAFETY ORDERS.
7. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FROM EXISTING RECORDS AND CORROBORATED, WHERE POSSIBLE WITH FIELD TIES. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE LOCATIONS SHOWN, BOTH HORIZONTALLY AND VERTICALLY, PRIOR TO CONSTRUCTION. IF EXISTING LOCATIONS VARY SUBSTANTIALLY FROM THE PLANS, THE ENGINEER SHOULD BE NOTIFIED TO MAKE ANY CONSTRUCTION CHANGES REQUIRED.
8. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT FOR ALL SEWER AND WATER MAIN UNDER CROSSING IN ACCORDANCE WITH PART 1 SECTION 5-2 OF THE STANDARD SPECIFICATION.
9. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUITS, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL SUBMIT WORK PLANS FOR ALL BORE OPERATIONS TWO WEEKS PRIOR TO COMMENCING WORK.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE POTHOLE AND LOCATING OF ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE AND MUST MAINTAIN 1' MINIMUM VERTICAL CLEARANCE.
12. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE CITY ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT.

VICINITY MAP – N.T.S.

GROUND BUS BAR
MECH. GRND. CONN.
CADWELD
ELECTRIC BOX
TELEPHONE BOX
EXISTING SERVICE POLE
SIDEWALK FLAG
EX. MANHOLE
LIGHT POLE
FOUNDATION
SPOT ELEV.
SET POINT
REVISION
DETAIL REF.
ELEVATION REF.
SECTION REF.
PROP./LEASE LINE
MATCH LINE
WORK POINT
TELE. CONDUIT
CENTERLINE
ELECT. CONDUIT
COAXIAL CABLE
MYERS PEDESTAL
VAULT STANDARD 2'X3'
STEEL POLE

SYMBOLS, LINETYPES AND HATCH PATTERNS

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS

APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

*2010 CALIFORNIA BUILDING CODE
*2010 CALIFORNIA MECHANICAL CODE
*2010 CALIFORNIA PLUMBING CODE
*2010 CALIFORNIA ELECTRICAL CODE

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

PROJECT DESCRIPTION

PROJECT CONSISTS OF INSTALLATION OF:

1. (2) OMNI DIRECTIONAL ANTENNAS ON EXISTING UTILITY POLE
2. EQUIPMENT VAULT AT THE BASE OF EXISTING POLE
3. EQUIPMENT PEDESTAL W/ BBU AND ELECTRICAL METER AT BASE OF POLE

SHEET INDEX:

EROSION AND SEDIMENT CONTROL NOTES

TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE LOCAL JURISDICTION "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED GRADING/IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER AND/OR WATER POLLUTION CONTROL PLAN (WPCP).
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. FOR INLETS LOCATED AT SUMPS ADJACENT TO TOP OF SLOPES, THE CONTRACTOR SHALL ENSURE THAT WATER DRAINING TO THE SUMP IS DIRECTED INTO THE INLET AND THAT A MINIMUM OF 1.00" FREEBOARD EXISTS AND IS MAINTAINED ABOVE THE TOP OF THE INLET. IF FREEBOARD IS NOT PROVIDED BY GRADING SHOWN ON THESE PLANS, THE CONTRACTOR SHALL PROVIDE IT VIA TEMPORARY MEASURES, I.E. GRAVEL BAGS OR DIKES.
4. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR OR QUALIFIED PERSON SHALL CHECK AND MAINTAIN ALL LINED AND UNLINED DITCHES AFTER EACH RAINFALL.
6. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
7. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON, ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
8. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL MEASURES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
9. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
11. ALL EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED GRADING PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
12. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
13. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
14. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDIMENT CONTROL MEASURES.
15. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

TRAFFIC CONTROL NOTES

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN (11" X 17") FOR APPROVAL PRIOR TO STARTING WORK. THE PLAN SHOULD BE SUBMITTED TO THE TRAFFIC CONTROL PERMIT COUNTER. CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO STARTING WORK, AND A MINIMUM FIVE (5) DAYS IF WORK WILL AFFECT A BUS STOP OR AN EXISTING TRAFFIC SIGNAL, OR IF WORK WILL REQUIRE A ROAD OR ALLEY CLOSURE.

FOOTAGE TOTALS	
ASPHALT CUT	–
DIRT TRENCH	–
PUNCH THRU	–
BORE	–
TOTAL	–
R&R SWF TOTAL	–

PROJECT DICTIONARY

SITE ADDRESS: ROW ADJACENT WEST SIDE OF SHEFFIELD DRIVE (ADJACENT TO 2165 BIRNAM WOOD DR) SANTA BARBARA, CA 93108

APPLICANT: CROWN CASTLE NG WEST, INC
2125 WRIGHT AVE, SUITE #C9
LA VERNE, CA 91750
CONTACT: DANIEL NUESKE
PHONE: (714) 472-1577

CIVIL ENGINEER: CONNELL DESIGN GROUP, LLC
26455 RANCHO PARKWAY SOUTH
LAKE FOREST, CA 92630
CONTACT: FRANK CARTER
(949) 310-8233 PHONE
(949) 753-8833 FAX

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/05/2013	ISSUED FOR REVIEW
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ENGINEER/CONSULTANT:

Civil Engineer
CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MON03m1
VERIZON MONTECITO-MON03m1

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C2
ROW ADJACENT WEST SIDE OF SHEFFIELD DRIVE
(ADJACENT TO 2165 BIRNAM WOOD DR)
SANTA BARBARA, CA 93108
LAT: 34.43090
LONG: -119.60515

SHEET TITLE:

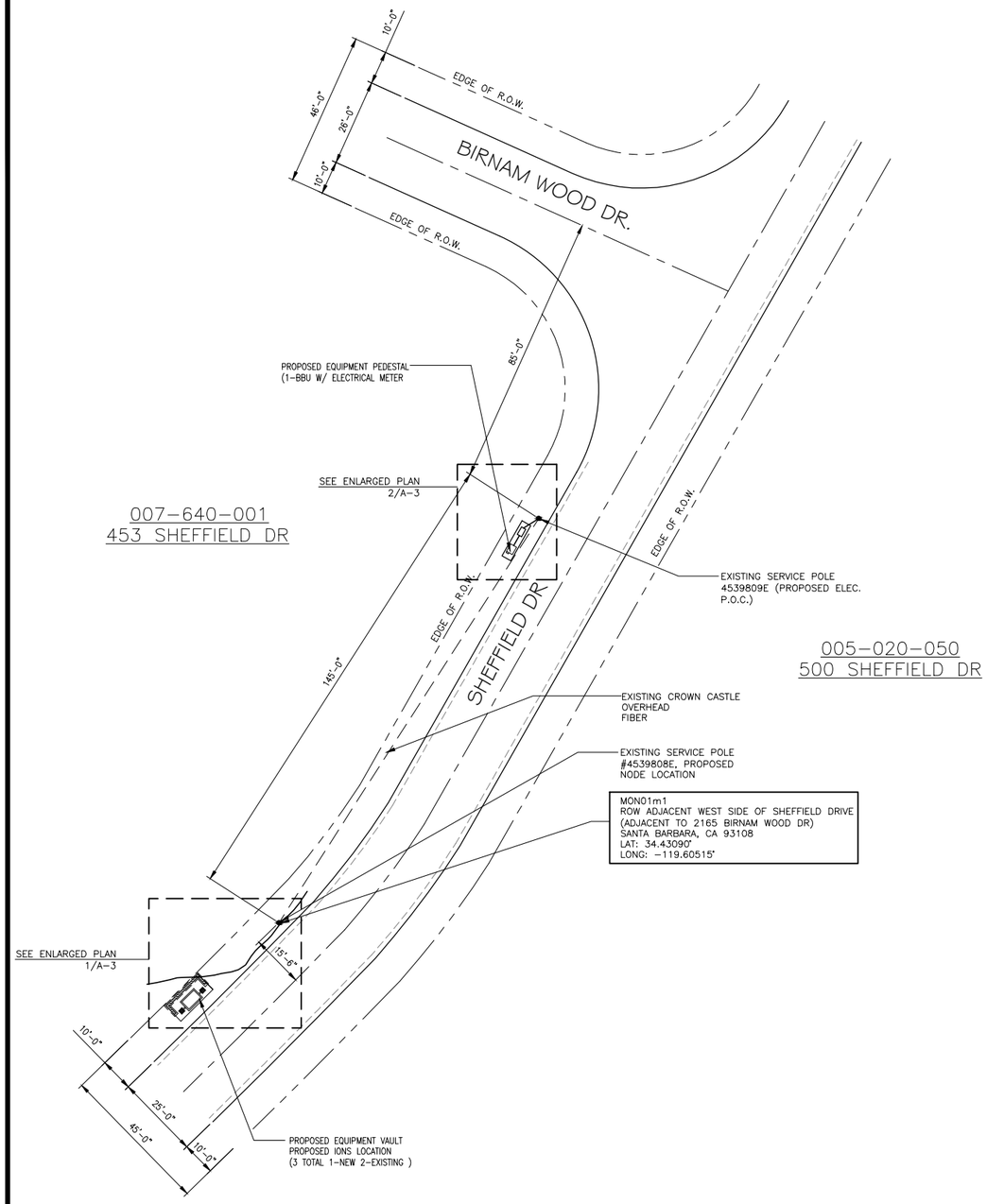
TITLE SHEET

DRAWING INFO:

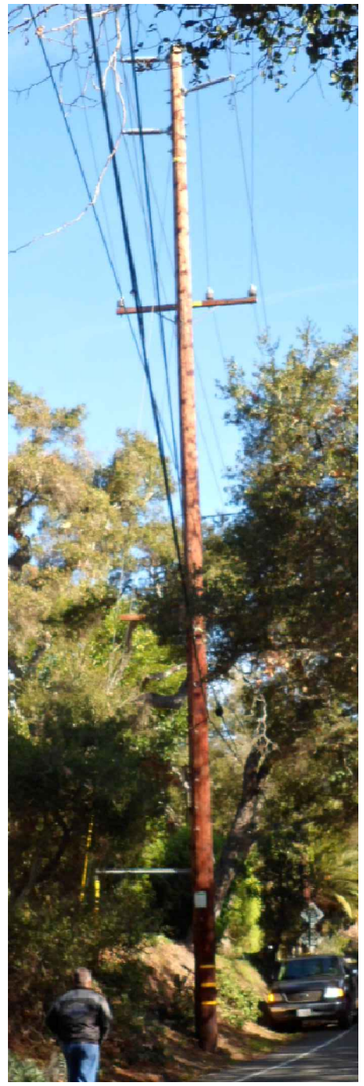
DRAWN BY:
FC

SHEET NUMBER:

T-1



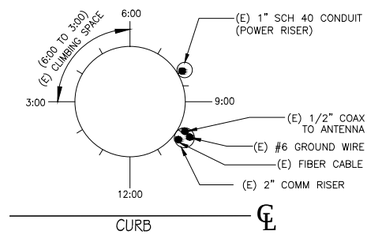
SITE PLAN — SCALE: 1"=20'-0" (0, 10', 20') — 1



EXISTING PHOTO — SCALE: N.T.S. — 2

POLE WILL BE STEPPED IN
ACCORDANCE TO GO95 STANDARDS
IN RESPECT TO CLIMBING SPACE.

1-2" NEXTG RISER @ 10:00
1-1" POWER RISER @ 8:00



RISER PROFILE — SCALE: N.T.S. — 3

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VERIZON MONTECITO-MON03m1

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LAT: 34.43090
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SHEET TITLE:

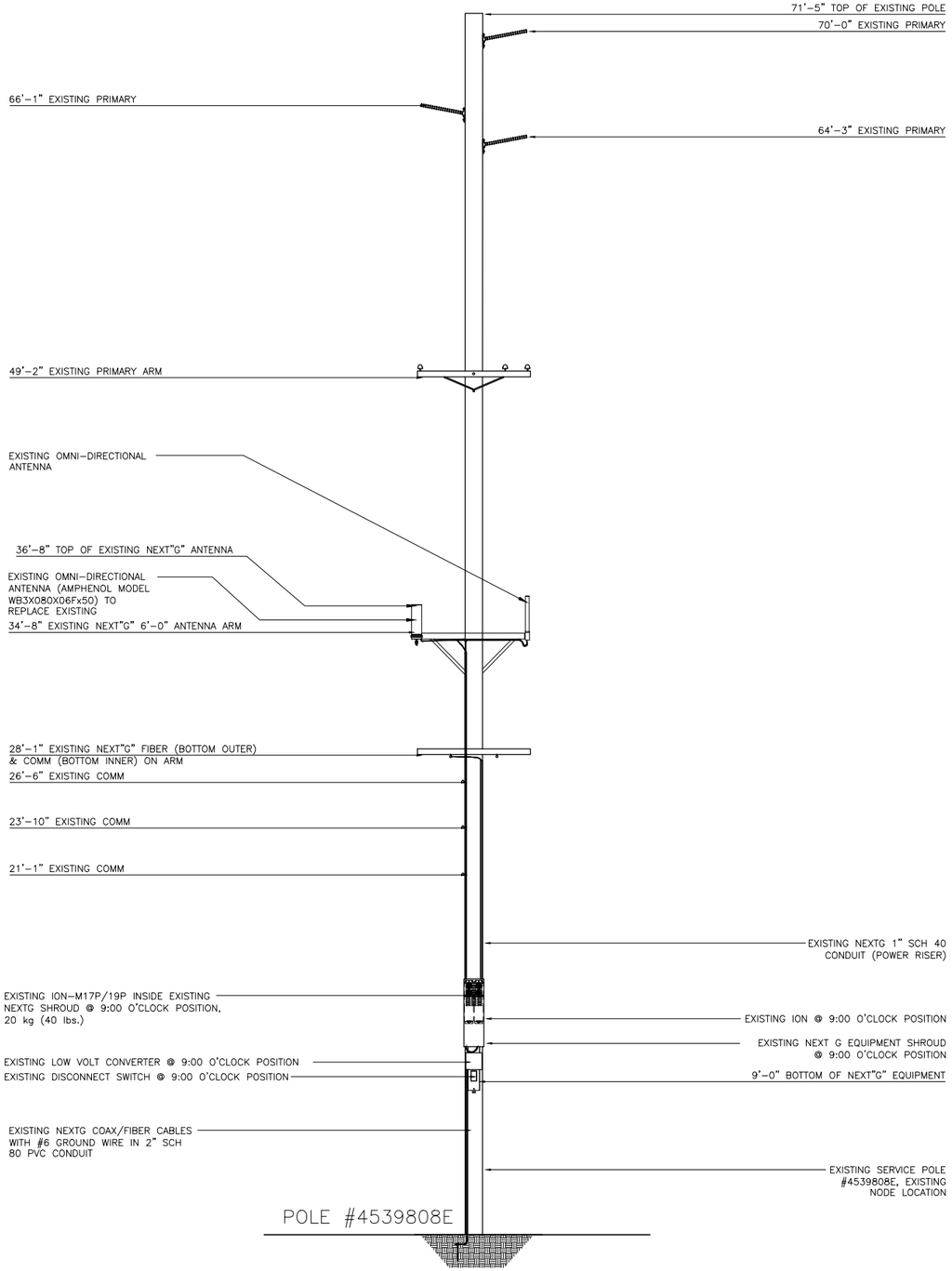
SITE PLAN AND ELEVATION

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

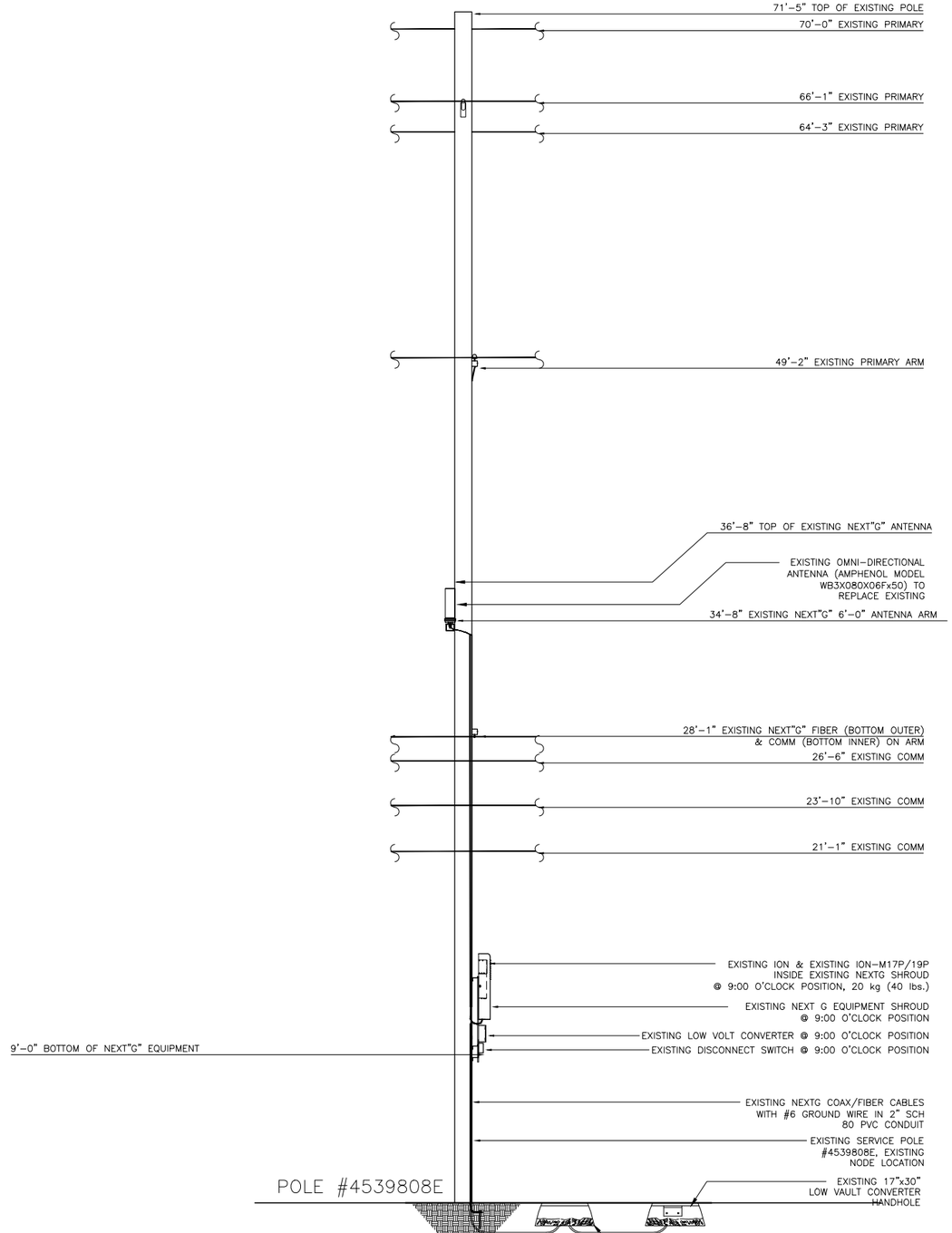
A-1



EXISTING ELEVATION LOOKING SOUTHWEST

SCALE: 1/4"=1'-0" (0, 2', 4')

2



EXISTING ELEVATION LOOKING NORTHWEST

SCALE: 1/4"=1'-0" (0, 2', 4')

1

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SHEET TITLE:

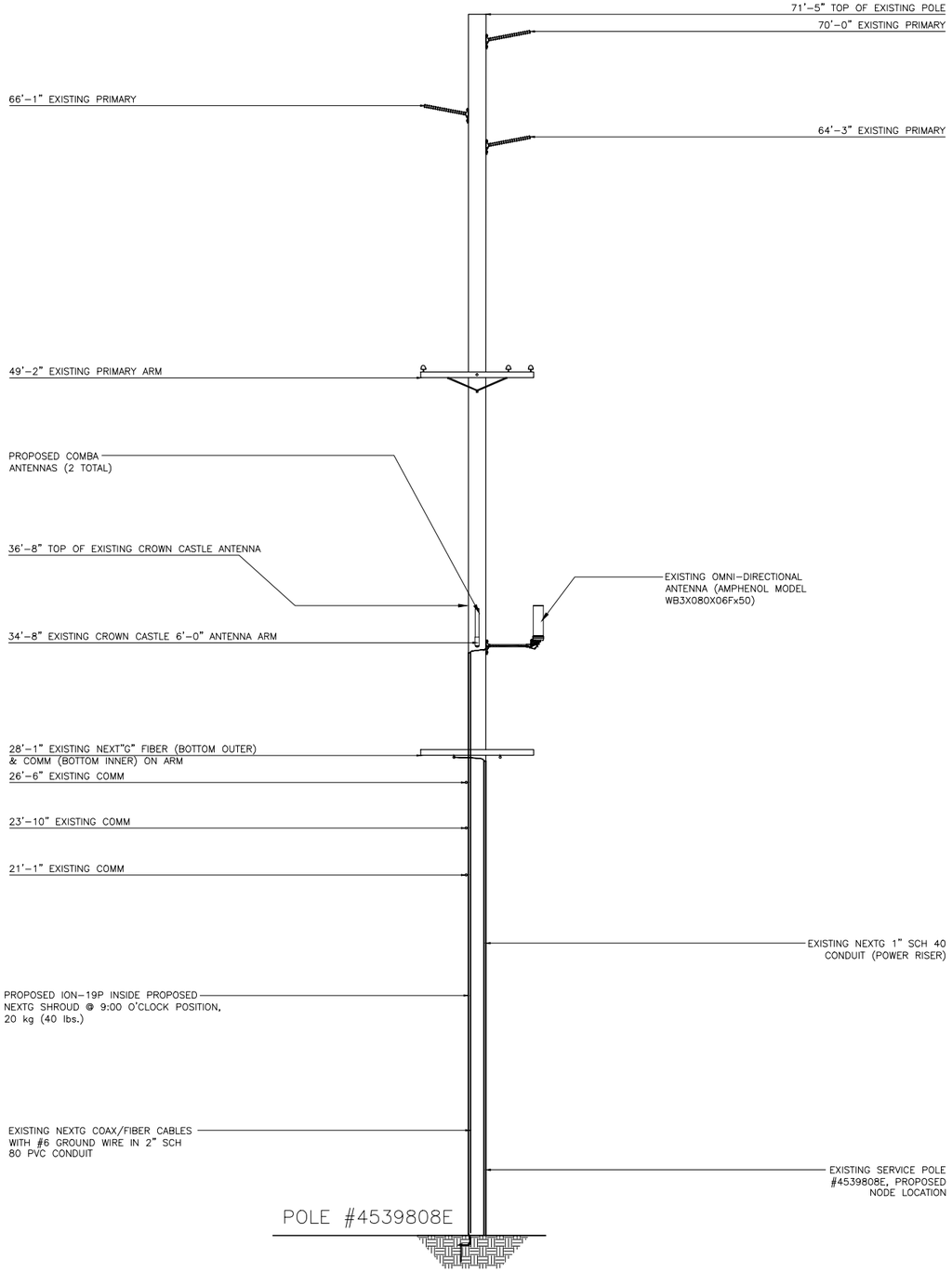
ELEVATION

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

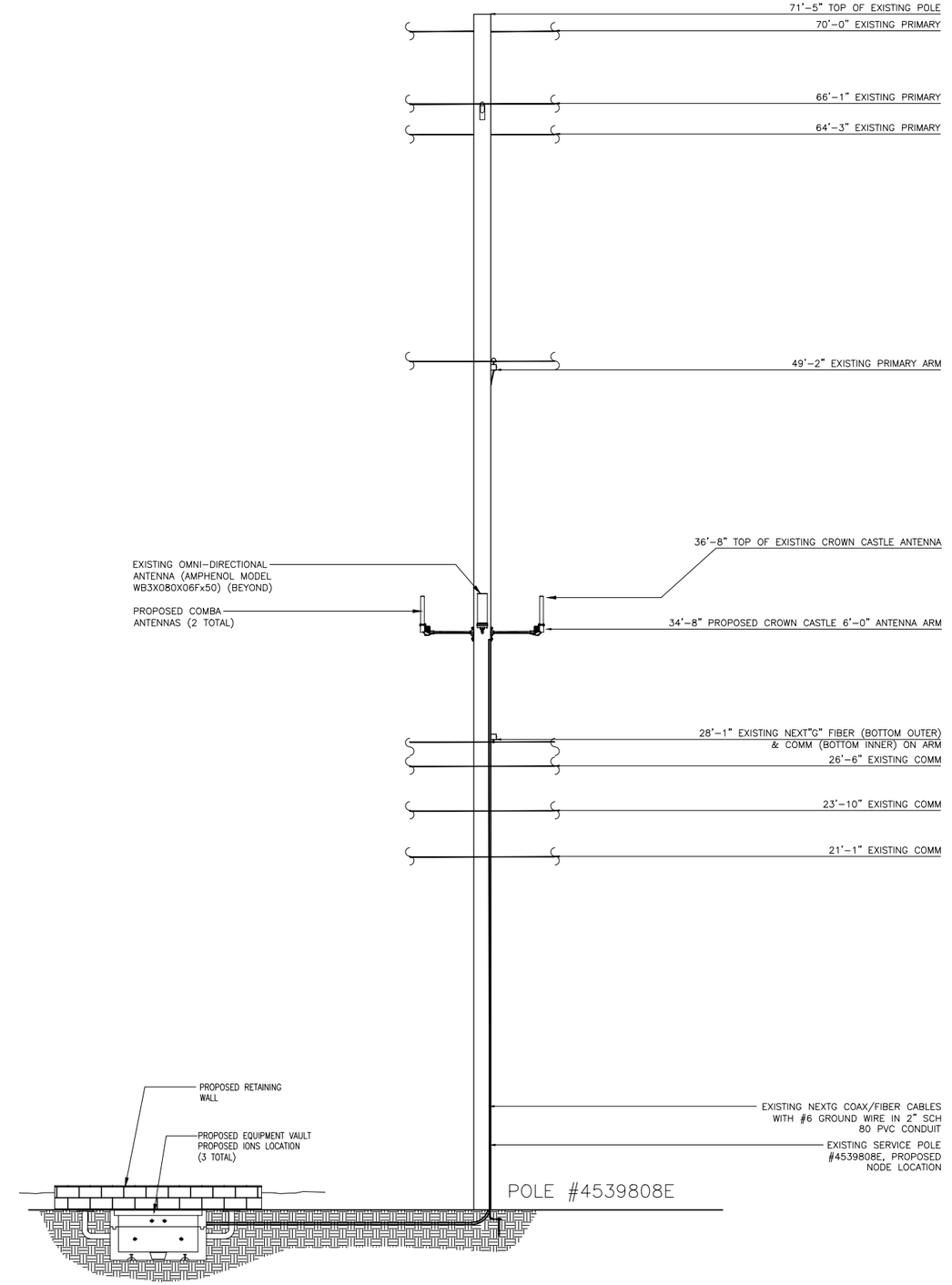
A–2



PROPOSED ELEVATION LOOKING SOUTHWEST

SCALE: 1/4"=1'-0" (0 2' 4')

2



PROPOSED ELEVATION LOOKING NORTHWEST

SCALE: 1/4"=1'-0" (0 2' 4')

1

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LAT: 34.43090
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SHEET TITLE:

ELEVATION

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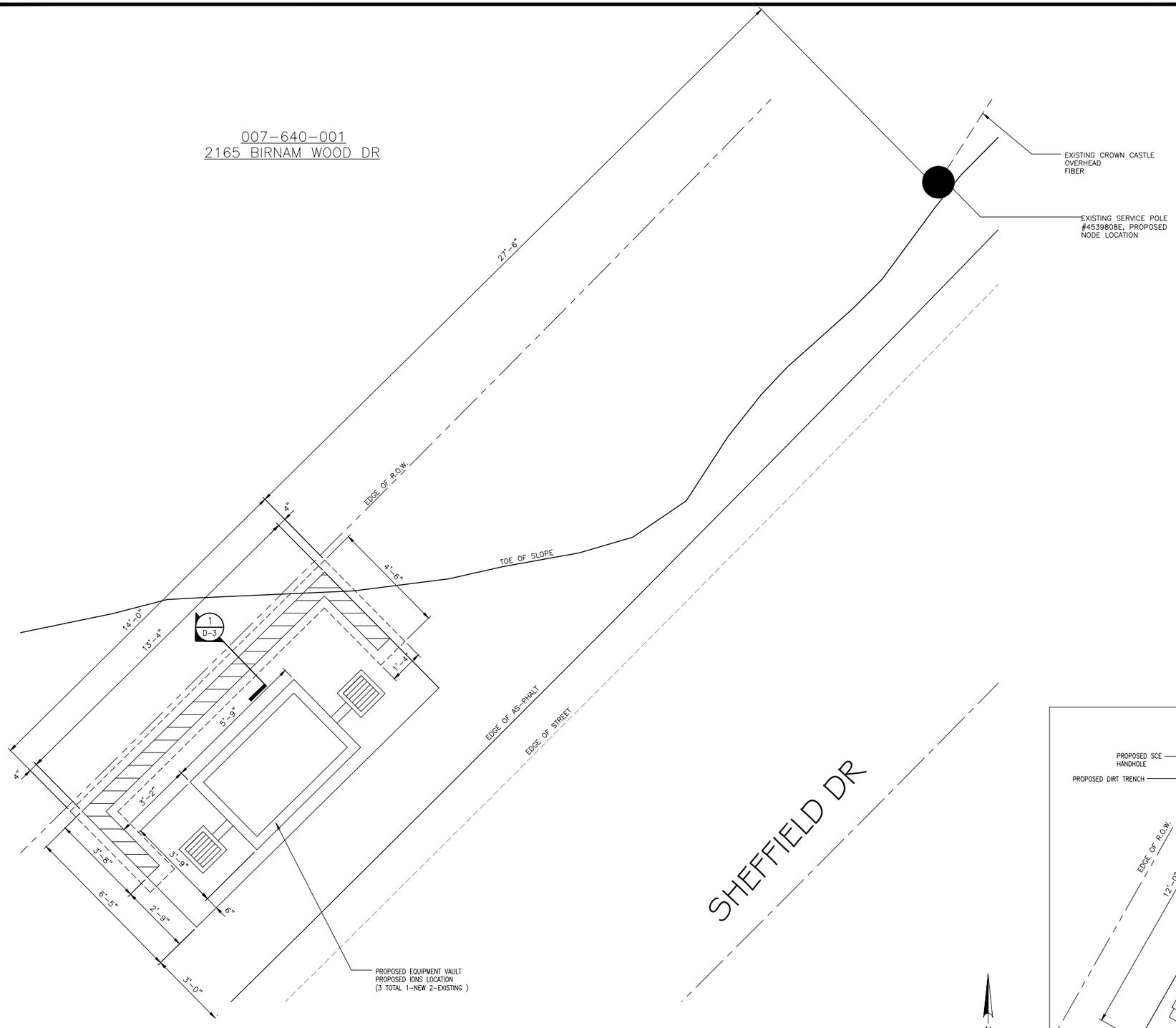
FC

SHEET NUMBER:

A-3

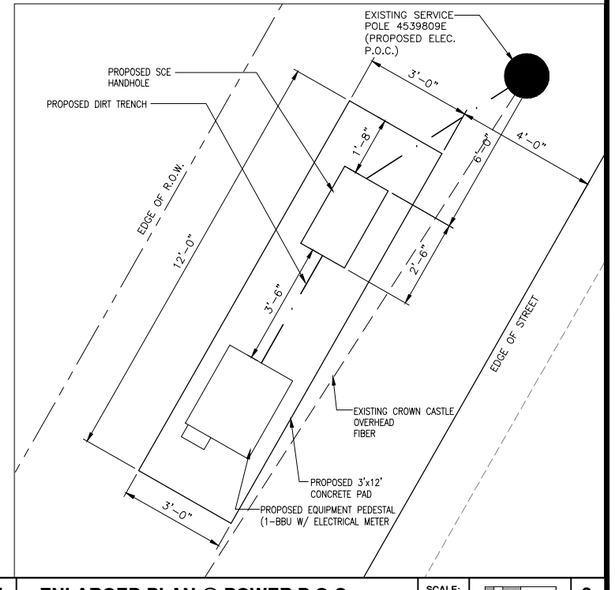
007-640-001
2165 BIRNAM WOOD DR



ENLARGED SITE PLAN

SCALE: 1/2"=1'-0" 0 1' 2'

1



ENLARGED PLAN @ POWER P.O.C.

SCALE: 1/2"=1'-0" 0 1' 2'

2

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MONO3m1
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SHEET TITLE:

ENLARGED SITE PLAN

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

A-4

Outdoor Omni-directional Antenna

COMBA

OOA-360V06N0-3 VPol, 696-960/1710-2170MHz, 360°, 4.0/6.0dBi

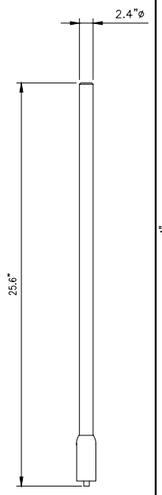
Technical Specifications

Electrical

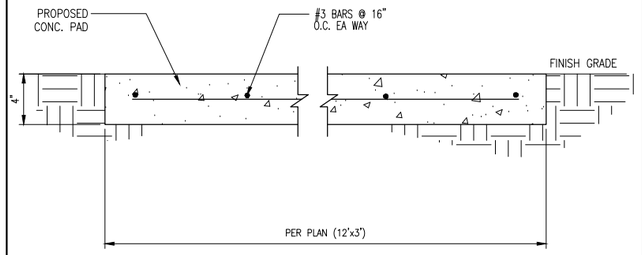
Frequency Range	MHz	696–960	1710–2170
Polarization		Vertical	
Gain	dBi	4.0±1	6.0±1
Horizontal Beamwidth	deg	360	
Vertical Beamwidth	deg	22–53	20–26
Electrical Downtilt–Fixed	deg	0	
VSWR		1.8	
Maximum Power	W	200	
Impedance		50	
Lightning Protection		Direct Ground	

Mechanical

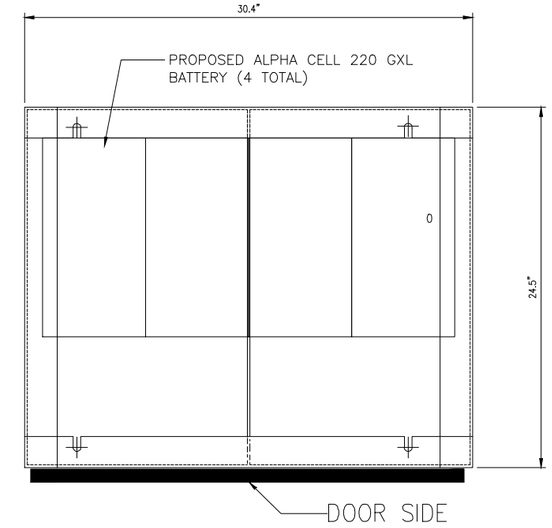
Dimensions, HxDia	mm(in)	650x60 (25.6x2.4)
Weight, with Mounting kit	kg (lb)	1 (2.2)
Radome Material and Color		Fiberglass, Light Grey
Radiating Element Material		Copper
Connector Type and Location		N-Female, Bottom
Operational Temperature		-55 to +70
Operational Humidity	%	95
Operational Wind Speed	km/h (mph)	200 (124)
Shipping Dimensions, HxWxD	mm (in)	670x100x100 (26.4x3.9x3.9)
Shipping Weight	kg (lb)	1.2 (2.65)

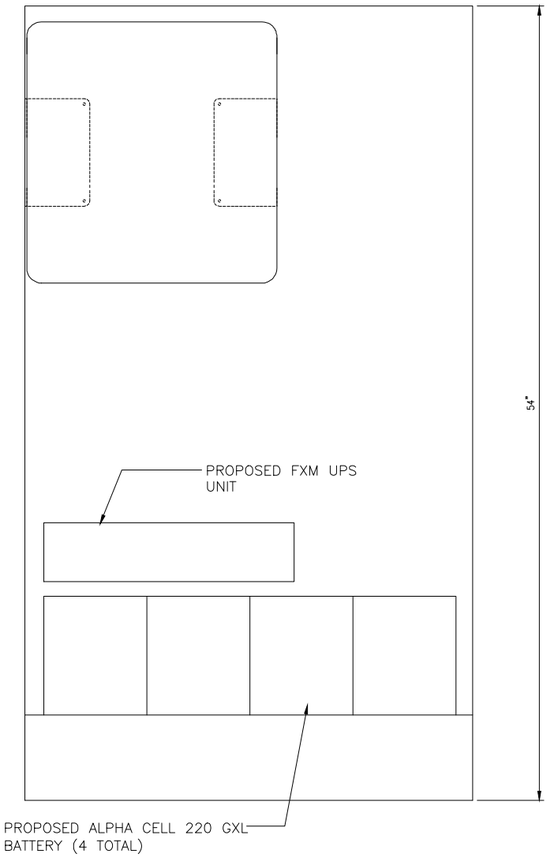


ANTENNA SPECIFICATIONS N.T.S. 1



CONCRETE PAD N.T.S. 3





Electrical

Power Supply
Mains power, Vac . . . . . 115 or 230

Power consumption, Watts . . . . . 1100 max.
< 750 @ normal operation

700 MHz SISO/MIMO

Frequency range, MHz
Uplink . . . . . 698 to 716/776 to 787
Downlink . . . . . 728 to 757

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
LTE	43	40**	37	34

850 MHz

Frequency range, MHz
Uplink . . . . . 824 to 849
Downlink . . . . . 869 to 894

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
Analog	43	40	37	34
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

20W for Cell, PCS bands and 700MHz MIMO

1900 MHz

Frequency range, MHz
Uplink . . . . . 1850 to 1915
Downlink . . . . . 1930 to 1995

Output power per carrier*, dBm

Number of Carriers	1	2	4	8
GSM	43	40	37	34
CDMA	43	40	37	34
LTE	43	40 **	37	34
UMTS	42	39	36	33

CommScope

ION-M7P/7P/85P/19P

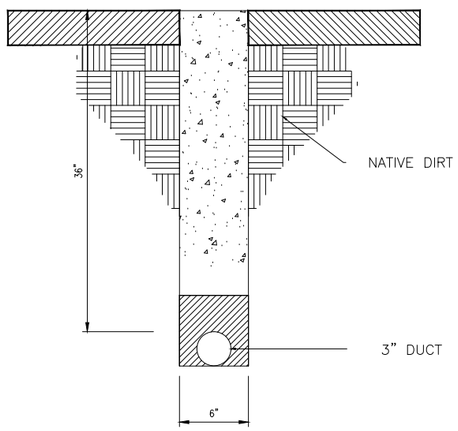
Noise figure, dB
ICP3 optimized . . . . . +10 max.
Noise figure optimized . . . . +6 max.
4.5 typical

Mechanical****

Height, width, depth, mm (in) . . . . . 817 x 245 x 218 (32.2 x 9.6 x 8.6)

Weight, kg (lb) 40 (88.2)

ION-M7P/7P/85P/19P N.T.S. 2



* TRENCH TO BE BACK FILL WITH NATIVE MATERIAL & COMPACTED TO 90% OR BETTER & REPLACE LANDSCAPING IN KIND.

TRENCH N.T.S. 4

EQUIPMENT PEDESTAL N.T.S. 5

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CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

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MON03m1
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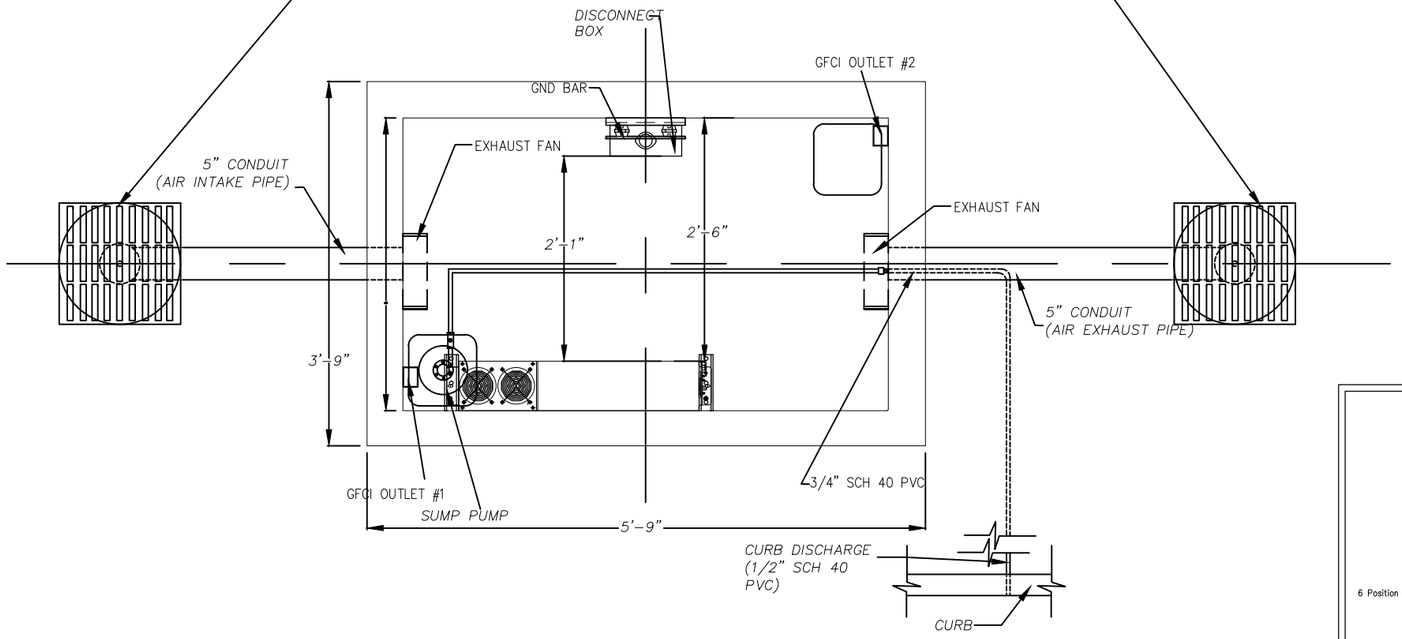
LONG: -119.60515

SHEET TITLE:
DETAILS

DRAWING INFO:
DRAWN BY:
FC

SHEET NUMBER:
D-1

(2) FLUSH MOUNTED VENT(S) WILL BE LOCATED IN A MANNER TO INSURE PROPER CLEARANCES IN ACCORDANCE TO CITY SPECIFICATIONS
(DB1212P PARKWAY GRATE CAST IRON 15" X15" 31 LBS)



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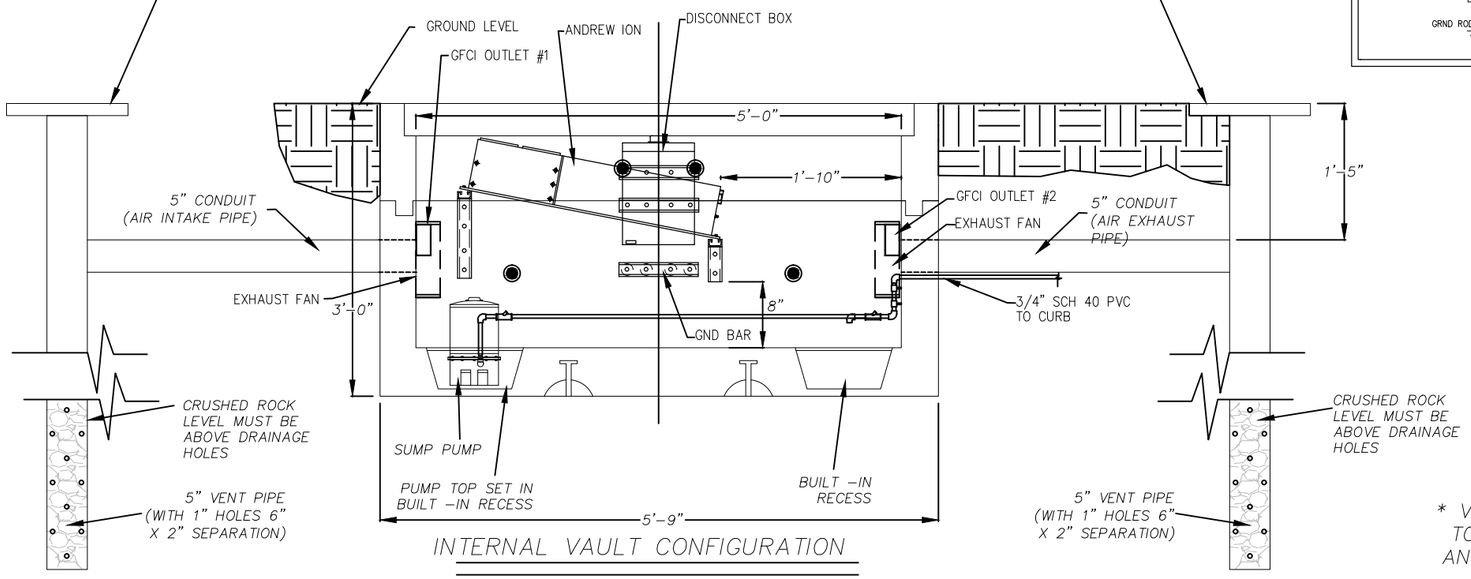
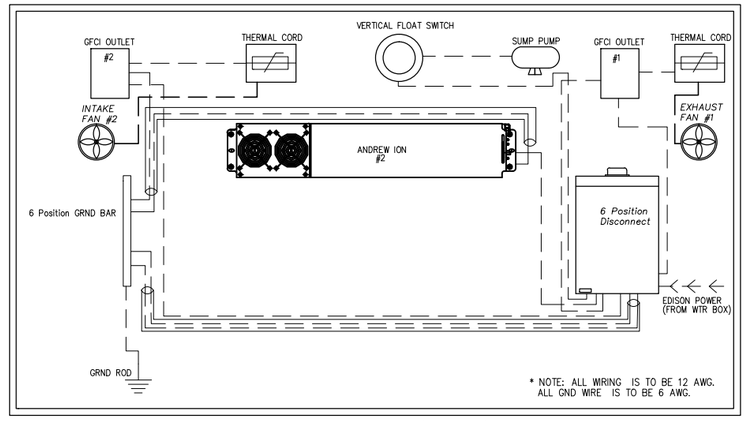
(DB1212P PARKWAY GRATE CAST IRON 15" X15" 31 LBS)



INTERNAL VAULT CONFIGURATION

WIRING SCHEMATIC



— — — GROUND WIRE (6 AWG)
— — — POWER WIRE (12 AWG)
1/2" LIQUIDTIGHT FLEX

* VENTS CAN BE FIELD CONFIGURED TO REDUCE OVER ALL FOOT PRINT AND AID REDUCING THE IMPACT ON THE SURROUNDING ENVIRONMENT.

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STAMP:

SITE INFO:

SITE NAME:
MON03m1
VERIZON MONTECITO-MON03m1

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C2
ROW ADJACENT WEST SIDE OF SHEFFIELD DRIVE
(ADJACENT TO 2165 BIRNAM WOOD DR)
SANTA BARBARA, CA 93108
LAT: 34.43090
LONG: -119.60515

SHEET TITLE:

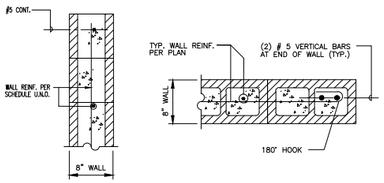
DETAILS

DRAWING INFO:

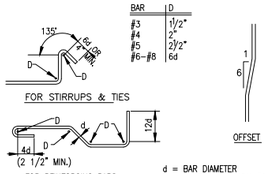
DRAWN BY:
FC

SHEET NUMBER:

D-2



CMU DETAIL @ TOP / END

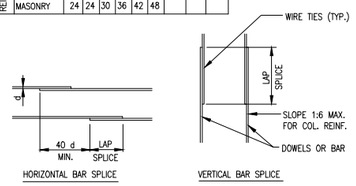


TYP. BAR BEND RADIUS

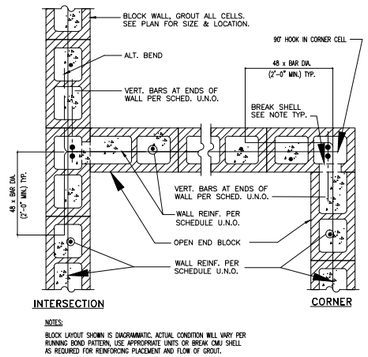
	CONC. F'c P.S.I.	BAR SIZE 3	4	5	6	7	8	9	10	11
		LAP SPLICE (INCHES)								
HORIZONTALLY PLACED REINFORCING	2000	24	24	36	50	69	91	115	145	178
	3000	24	29	36	46	63	82	104	132	165
	4000	24	29	36	43	54	71	90	115	141
	MASONRY	24	24	30	36	42	48			

NOTES :

1. ALL VERTICAL REINFORCING FOR COL., PIERS & WALLS SHALL BE DOWELED AS SHOWN EXCEPT SPECIFIC DETAILS ON DRAWINGS SHALL GOVERN IN CASES OF CONFLICT.
2. DOWELS SHALL BE THE SAME GRADE, SIZE AND NUMBER AS VERTICAL REINFORCING.



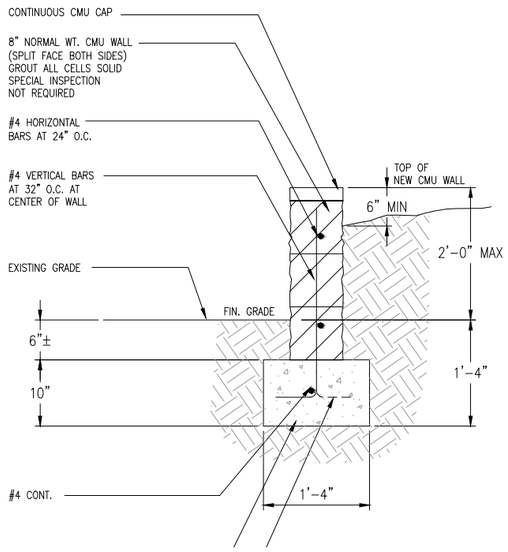
TYP. BAR LAP SPLICE



NOTES:

BLOCK LAYOUT SHOWN IS DIAGRAMMATIC. ACTUAL CONDITION WILL VARY PER RUNNING BOND PATTERN, USE APPROPRIATE UNITS OR BREAK CMU SHELL AS REQUIRED FOR REINFORCING PLACEMENT AND FLOW OF GROUT.

CMU DETAIL @ CORNER / INTERSECTION



CMU WALL DETAIL

N.T.S. | 1

AlphaCell
General Specifications

Model:	220 GXL	195 GXL	165 GXL
Warranty[1]:	4 to 5 year full replacement	4 to 5 year full replacement	4 to 5 year full replacement
Service Life:	Extended	Extended	Extended
Runtime (minutes)[2]:	220	195	165
Sealed VRLA:	Valve regulated lead acid	Valve regulated lead acid	Valve regulated lead acid
Heat Resistant:	Extreme	Extreme	Extreme
Hydrogen Emission:	Low	Low	Low
Terminals:	Threaded insert 1/4" - 20 UNC	Threaded insert 1/4" - 20 UNC	Threaded insert 1/4" - 20 UNC

Specifications[4]

Model:	220 GXL	195 GXL	165 GXL
Typical Runtime (minutes)[2]:	220	195	165
Cells Per Unit:	6	6	6
Voltage Per Unit:	12.8	12.8	12.8
Conductance Value:	1175	1100	1000
Max. Discharge Current (A):	900	900	800
Short Circuit Current (A):	2800	2600	2500
10 Second Volts @ 100A:	11.4	11.3	11.2
Ohms Impedance 60Hz:	0.0050	0.0050	0.0055
Nominal Capacity at 20hrs: (to 1.75VPC)	109Ah	100Ah	86
Nominal Capacity at 20hrs: (to 1.70VPC)	110Ah	102Ah	87
BCI Group Size:	31	31	27
Weight (lb/kg):	73/33.2	67/30.5	63/28.6
Height w/ Terminals (in/mm):	8.48/215.4	8.48/215.4	8.05/204.5
Width (in/mm)[3]:	13.42/340.9	13.42/340.9	12.5/317.8
Depth (in/mm)[3]:	6.80/172.7	6.80/172.7	6.83/173.4
Operating Temperature Range Discharge:	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)
Charge (with temp compensation):	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)	-23 to 60°C (-9.4 to 140°F)
Float Charging Voltage (Vdc):	13.5 to 13.8	13.5 to 13.8	13.5 to 13.8
AC Ripple Charger:	0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P		

Notes:
[1] Warranty varies by country and region. Warranty valid only when used with Alpha approved Power Supplies, Chargers and Enclosures. Consult your sales person for details.
[2] Runtimes calculated using a 25A DC constant current load.
[3] Dimensions at top of battery.
[4] See AlphaCell Users Guide for Additional Details.

Typical Standby Time in Minutes @ 25°C/77°F

XM290Vac@	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	508	453	396	320	285	249	236	209	183	186	165	144
4 batteries:	701	625	546	444	396	346	329	293	256	261	232	203
6 batteries:	1091	978	853	701	625	546	523	465	407	418	372	325
8 batteries:	1487	1338	1165	960	859	750	720	643	562	577	515	450
9 batteries:	1686	1519	1322	1091	978	853	820	733	640	659	587	514
XM290Vac@	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	149	132	115	119	106	92	101	89	77	87	78	66
4 batteries:	210	187	163	169	151	132	144	128	112	124	111	96
6 batteries:	339	301	264	275	245	214	236	209	183	204	182	159
8 batteries:	478	419	367	385	341	299	329	293	256	288	255	223
9 batteries:	538	479	419	440	391	342	377	335	294	329	293	256
XM260Vac@	4A			6A			8A			10A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	798	712	622	508	453	396	377	335	294	300	267	233
4 batteries:	1091	978	853	701	625	546	523	465	407	418	372	325
6 batteries:	1686	1519	1322	1091	978	853	820	733	640	659	587	514
8 batteries:	2288	2067	1798	1487	1338	1165	1122	1006	877	904	809	706
9 batteries:	2590	2345	2037	1686	1519	1322	1273	1143	997	1027	921	803
XM260Vac@	12A			14A			16A			18A		
Battery Runtime:	220	195	165	220	195	165	220	195	165	220	195	165
3 batteries:	242	215	188	196	174	151	166	148	125	144	128	107
4 batteries:	339	301	264	275	245	214	236	209	182	204	182	155
6 batteries:	538	479	419	440	391	340	377	335	290	329	293	252
8 batteries:	741	660	577	607	541	470	523	465	402	458	407	351
9 batteries:	843	753	658	692	617	538	597	531	462	523	465	402

*Above calculations based on an AC load with a .90 cable plant power factor.

For contact information visit www.alpha.com

The Alpha Group >

North America	Europe, Middle East & Africa			Asia Pacific	Latin & South America
Canada Tel: +1 604 430 1476 Fax: +1 604 430 8908 Toll Free: +1 800 667 8743	Cyprus Tel: +357 25 375 675 Fax: +357 52 359 595	Germany Tel: +49 9122 79889 0 Fax: +49 9122 79889 21	Lithuania Tel: +370 5 210 5291 Fax: +370 5 210 5292	P.R. China Tel: +852 2736 8663 Fax: +852 2199 7988	Contact USA office
USA Tel: +1 360 647 2360 Fax: +1 360 671 4936	Russia Tel: +7 495 925 9844 Fax: +7 495 916 1349	United Kingdom Tel: +44 1279 501110 Fax: +44 1279 659870			

049-297-10-B002 (08/09)

BATTERY SPECIFICATIONS

N.T.S. | 2

REV:	DATE/BY:	REVISION DESCRIPTION:
0	FXC 03/05/2013	ISSUED FOR REVIEW
1	SA 03/19/2013	ISSUED FOR APPROVAL
2	FXC 03/27/2013	ISSUED FOR FINAL

ENGINEER/CONSULTANT:

Civil Engineer
CDG
CONNELL DESIGN GROUP, LLC
CONSULTING CIVIL ENGINEERS
26455 RANCHO PARKWAY SOUTH, LAKE FOREST, CA 92630
(949) 753-8807 OFFICE - (949) 753-8833 FAX

CLIENT:

CROWN CASTLE
NG WEST, INC.

STAMP:

SITE INFO:

SITE NAME:
MONO3m1
VERIZON MONTECITO-MONO3m1

SITE ADDRESS: THOMAS BROS PAGE 997 GRID C2
ROW ADJACENT WEST SIDE OF SHEFFIELD DRIVE
(ADJACENT TO 2165 BIRNAM WOOD DR)
SANTA BARBARA, CA 93108
LAT: 34.43090
LONG: -119.60515

SHEET TITLE:

DETAILS

DRAWING INFO:

DRAWN BY:
FC

SHEET NUMBER:

D-3

Attachment 2

Antenna Specifications

Outdoor Omni-directional Antenna

OOA-360V06N0-3 VPol, 696-960/1710-2170MHz, 360°, 4.0/6.0dBi

Technical Specifications

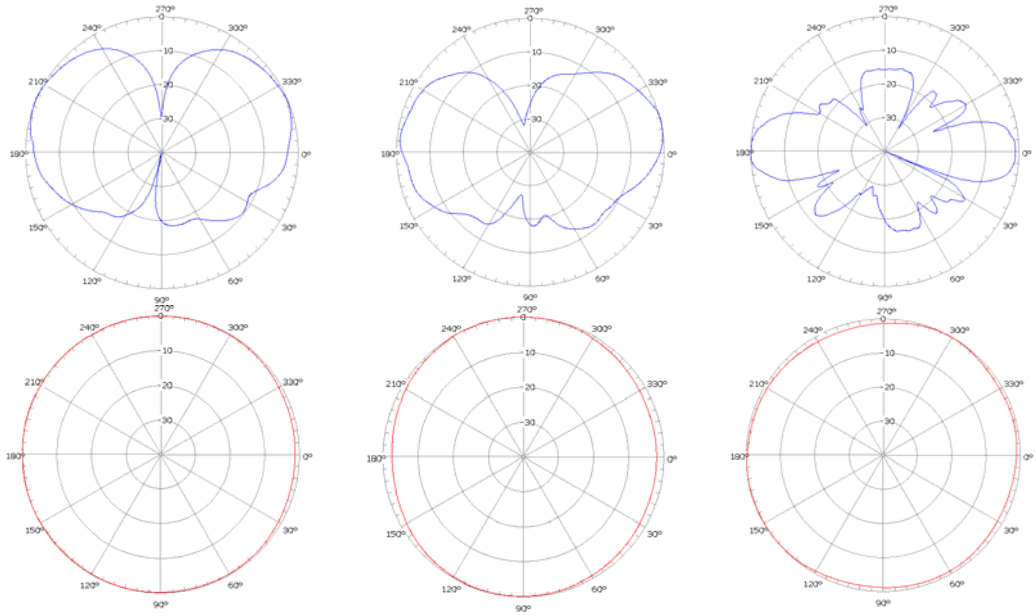
Electrical			
Frequency Range	MHz	696-960	1710-2170
Polarization		Vertical	
Gain	dBi	4.0±1	6.0±1
Horizontal Beamwidth	deg	360	
Vertical Beamwidth	deg	22-53	20-26
Electrical Downtilt – Fixed	deg	0	
VSWR		≤ 1.8	
Maximum Power	W	200	
Impedance	Ω	50	
Lightning Protection		Direct Ground	

Mechanical		
Dimensions, HxDia	mm (in)	650x60 (25.6x2.4)
Weight, with Mounting kit	kg (lb)	1 (2.2)
Radome Material and Color		Fiberglass, Light Grey
Radiating Element Material		Copper
Connector Type and Location		N-Female, Bottom
Operational Temperature	°C	-55 to +70
Operational Humidity	%	≤ 95
Operational Wind Speed	km/h (mph)	200 (124)
Shipping Dimensions, HxWxD	mm (in)	670x100x100 (26.4x3.9x3.9)
Shipping Weight	kg (lb)	1.2 (2.65)

Antenna Pattern

Vertical Pattern

Horizontal Pattern



696MHz 896MHz 1900MHz

WB3X080X06Fx50

Replace "x" with desired electrical downtilt.

X-Pol | TRIO, FET | 80° | 13.5 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1900-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	74°	78°	80°
Vertical beamwidth	22°	20°	18°
Gain	10.7 dBd (12.8 dBi)	11.1 dBd (13.2 dBi)	11.4 dBd (13.5 dBi)
Omni gain	4.9 dBd (7.0 dBi)		
Electrical downtilt (x)	0, 2		
Impedance	50Ω		
VSWR	<1.4:1		
1st Upper side lobe	< -16 dB		
Front-to-back	> 18 dB		
Inter-port isolation	24 dB		
Input power	6 x 300 W		
Connector(s)	6 Ports / 7-16 DIN Female / Radial		
Operating temperature	-40 to +60° C	-40 to +140° F	

Mechanical Characteristics		
Dimensions Length x Diameter	610 x 191 mm	24.0 x 7.5 in
Weight	5.9 kg	13.0 lbs
Survival wind speed	200 km/hr	125 mph
Wind load @ 160 km/hr (100 mph)	62 N	13.7 lbf

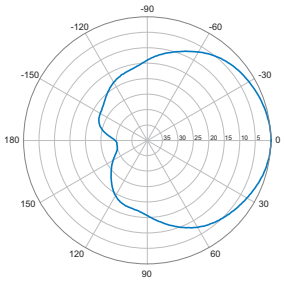
Mounting Options	Part Number
Pole mounting kit (Optional)	WB3X-MKS-01

Ordering Options	
The WB3X080X06Fx50 can be painted to blend in with the structure on which it is mounted. Select from the following options when ordering.	
Unpainted	WB3X080X06Fx50
Painted Brown	WB3X080X06Fx5BR
Painted Gray	WB3X080X06Fx5GR
Painted White	WB3X080X06Fx5WH

WB3X080X06Fx50

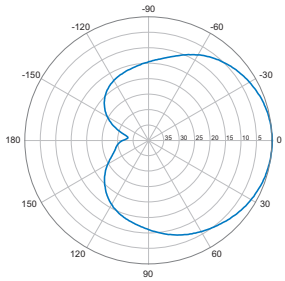
X-Pol | TRIO, FET | 80° | 13.5 dBi

1710-1880 MHz



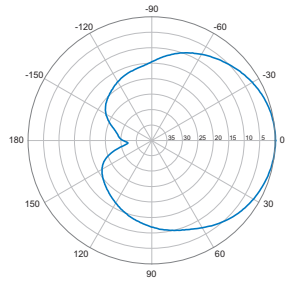
Horizontal | 1800 MHz

1850-1990 MHz

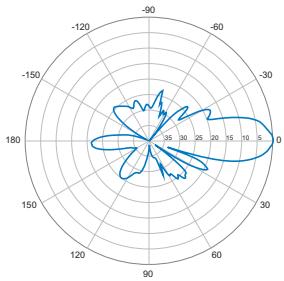


Horizontal | 1900 MHz

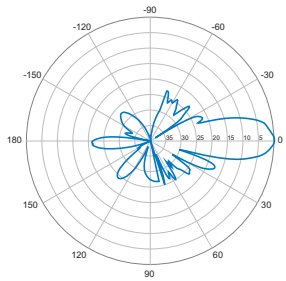
1900-2170 MHz



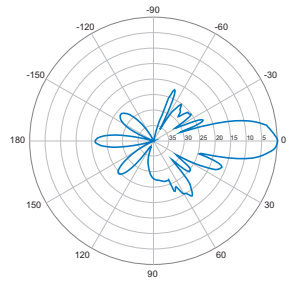
Horizontal | 2100 MHz



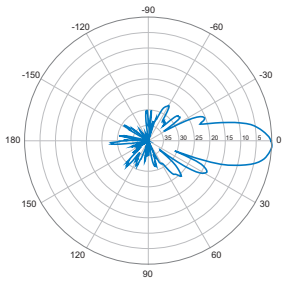
0° | Vertical | 1800 MHz



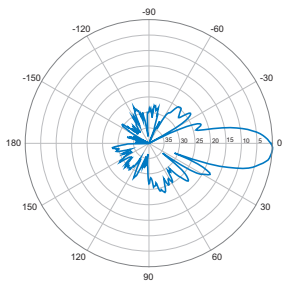
0° | Vertical | 1900 MHz



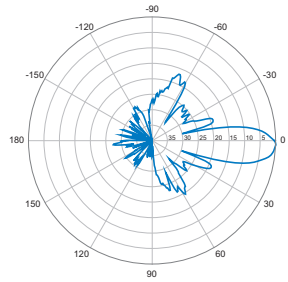
0° | Vertical | 2100 MHz



2° | Vertical | 1800 MHz



2° | Vertical | 1900 MHz

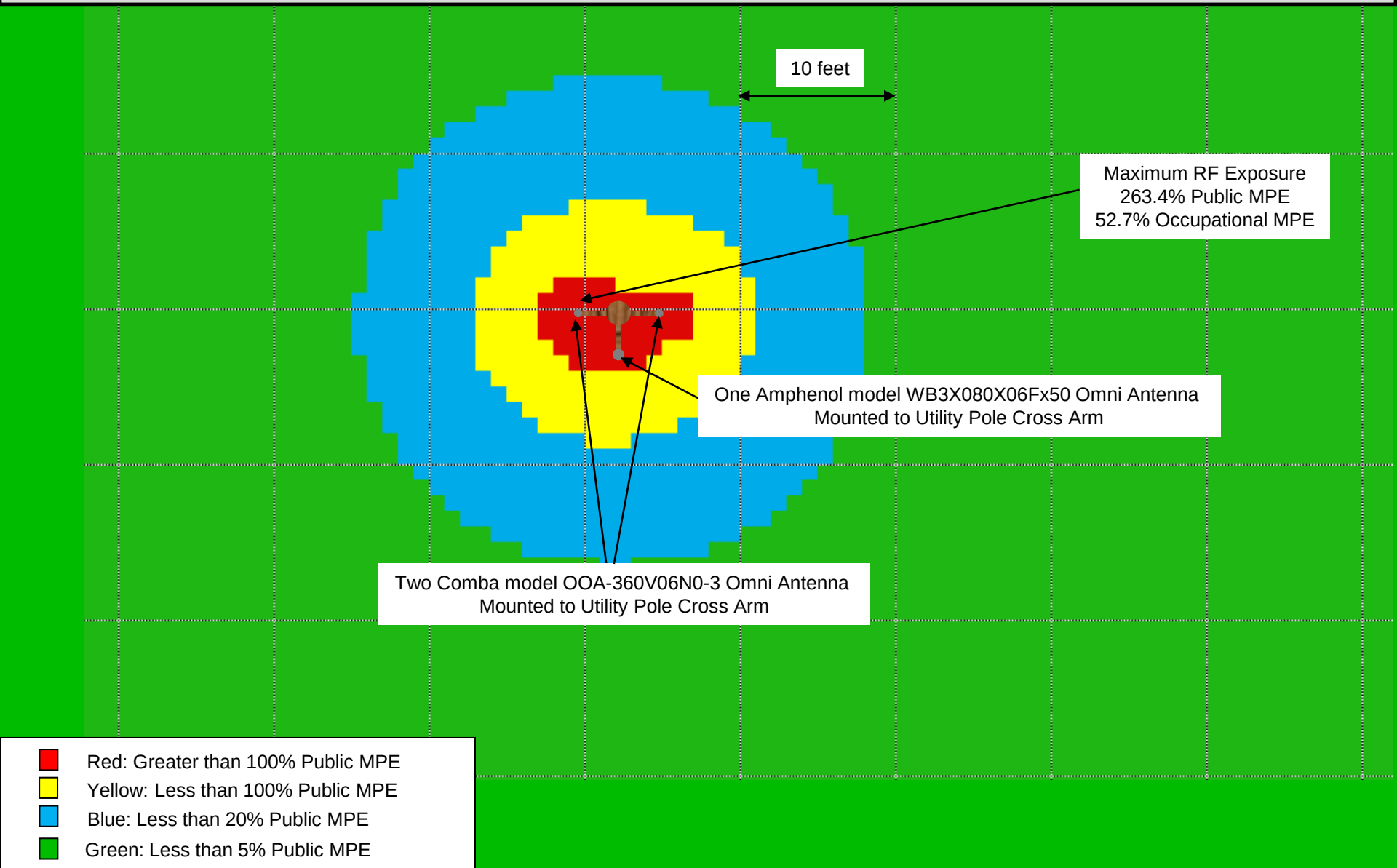


2° | Vertical | 2100 MHz

Appendix A-1

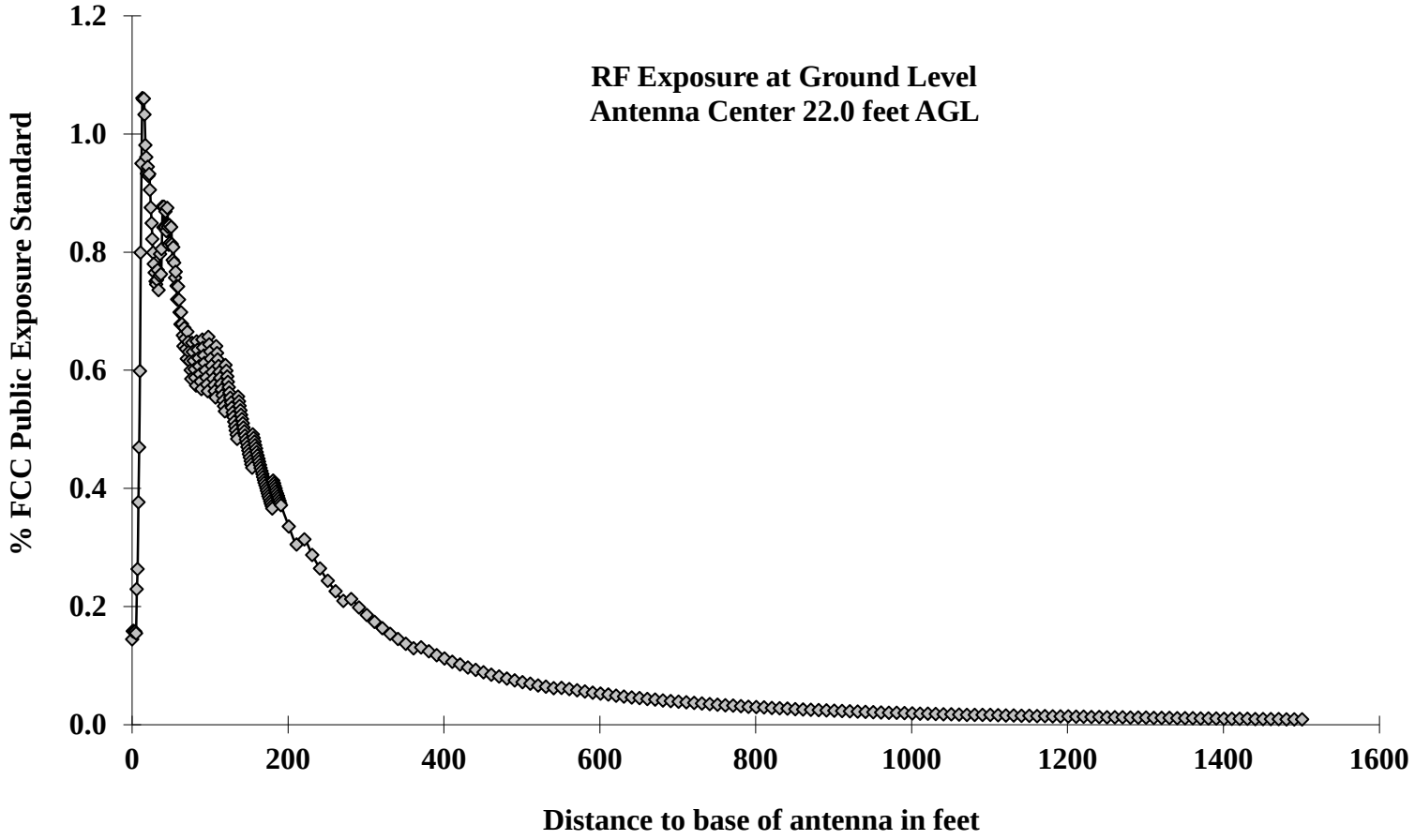
RF EXPOSURE AT ANTENNA LEVEL

RF EXPOSURE AT THE LEVEL OF THE ANTENNA
BASED ON PERCENTAGE OF FCC MAXIMUM
PUBLIC & OCCUPATIONAL EXPOSURE LIMIT



Appendix A-2

RF EXPOSURE AT GROUND LEVEL


RF Exposure at Ground Level
Antenna Center 22.0 feet AGL
% FCC Public Exposure Standard
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
200
400
600
800
1000
1200
1400
1600
Distance to base of antenna in feet

Appendix A-3

RF NOTICE SIGN

NOTICE

The radio frequency (RF) emissions at this site have been evaluated for potential RF exposure to personnel who may need to work near these antennae.

RF EXPOSURE AT 7 FEET OR CLOSER TO THE FACE OF THE ANTENNA MAY EXCEED THE FCC PUBLIC EXPOSURE STANDARD AND THUS ONLY QUALIFIED RF WORKERS MAY WORK IN THIS 7 FOOT EXCLUSION ZONE. OTHERS WHO NEED TO WORK IN THE EXCLUSION ZONE SHOULD CALL _____

FOR INSTRUCTIONS. REFER TO SITE # _____

Reference: Federal Communications Commission (FCC) Public Exposure Standard. OET Bulletin-65, Edition 97-01, August 1997.

STATEMENT OF EXPERIENCE

Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM, FAAPM
(800) 760-8414 jbushberg@hampc.com

Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. In addition, Dr. Bushberg has extensive experience and lectures on several related topics including medical physics, radiation protection, (ionizing and non-ionizing), radiation biology, the science of risk assessment and effective risk communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University was on various aspects of the biological effects of microwave radiation. He has maintained a strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, the California Council on Science and Technology, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections. Dr. Bushberg has performed RF & ELF environmental field measurements and recommend appropriate mitigation measures for numerous transmission facilities in order to assure compliance with FCC and other safety regulations and standards. The consultation services provided by Dr. Bushberg are based on his professional judgement as an independent scientist, however they are not intended to necessarily represent the views of any other organization.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of nonionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of nonionizing electromagnetic radiation. Dr.Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurements (NCRP). He is also the Senior Scientific Vice-President of the NCRP and chairman of the NCRP Board of Directors. Dr. Bushberg has served as chair of the NCRP committee on Radiation Protection in Medicine and he continues to serve as a member of this committee as well as the NCRP scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based, in large part, on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of responsibility the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg also served for several years as a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the FCC and the FDA Center for Devices and Radiological Health.

Dr. Bushberg is a full member of the Bioelectromagnetics Society, the Health Physics Society and the Radiation Research Society. Dr. Bushberg received both a Masters of Science and Ph.D. from the Department of Bionucleonics at Purdue University. Dr. Bushberg is a fellow of the American Association of Physicists in Medicine and is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to California, Dr. Bushberg was on the faculty of Yale University School of Medicine.